EVOLUTION AND SPATIAL ORGANIZATION OF CLAN SETTLEMENTS IN BHARATPUR DISTRICT, RAJASTHAN

ABSTRACT

THESIS

SUBMITTED FOR THE AWARD OF THE DEGREE OF

Doctor of Philosophy

IN

GEOGRAPHY

By

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ALIGARH MUSLIM UNIVERSITY
ALIGARH (INDIA)
2002
Settlements occupy an important position among all the visual imprints made by man upon the physical landscape through the process of cultural occupancy since the dawn of human civilization. The evolution and growth of a settlement in an area is the result of the interplay of the prevailing ecological conditions, cultural and social values of the residents, technology, management system and the settling process through time span. In the initial stage, settlement bear simple forms and have closed relationship with environment. However, increased of knowledge and growth of civilization increases variability in the forms and sizes of settlements.

The study area, Bharatpur District, is one of the most early settled region of the country involves interesting pattern of human congregation for which it has been purposively selected for making a humble contribution to growing field of settlement geography. The district has an agrarian base and present diverse physio-cultural and socio-economic condition at micro-level in its different parts. It is one of the most ancient settled region and has long history of peopling and occupancy. Several archaeological findings, historical records and local legends pertaining to the pre-historic time, show that the study area was initially occupied by Matsya tribe before the Aryans. Inspite of the intermixing of various ethnic groups and cultural traits from within and outside the area has preserved its own traditions, culture, myths, norms and values, which has resulted in shaping the uniqueness in its identity.

The objective of the present study is:
1. To study the physical, cultural and demographic parameters that give rise to variation in the macro and meso region of the study area, as base for human settlements.
2. To trace the evolution of rural settlements from pre-historic to modern period with the help of cultural ecology and place names analysis.
3. To examine the spatial organization and transformation by successive social groups or clans.
4. To deal with some salient characteristics of a few models of spatial diffusion.
5. To study the spatio-temporal analysis and diffusion of clan settlements.
6. To examine the caste structure which plays a significant role in the formation of socio-economic hierarchy.
7. To interpret the distributional pattern and inter-relationship among the rural settlement with the help of size (population and size), spacing (observed, expected and index of randomness) and other characteristic, through these findings an attempt has been made to measure the degree of concentration and dispersion to classify the rural settlements in different types.
8. To deal with the view of the shape analysis as well as the geometrical form of shapes, and to study the factors responsible for the formation of various pattern of rural settlement.
9. To study the morphology of dwellings on the basis of size and building material and suggest a suitable house plan for the district.
10. To analyse the social morphology of the selected villages (built-up areas) based on the relegio-rutual and secular dominance models and also to examine the influence of castes and dominant landownership on the spatial patterning of rural houses in the study area.
11. Finally, to summarize all the observations made during the course of study and the net results thereof.

The methodology of the present study is:

In order to analyze the evolution and spatial organization of clan settlements in Bharatpur District, there are so many sources which are extremely helpful in providing significant clues to the understanding of the evolution of clan settlement in the district e.g. archaeological findings, historical sources, various written records, place names, culture, cults, folk-lore, maps, field survey and interviews.
To examine the spatial distribution and types of settlement in terms of spacing, degree of dispersion and concentration, quantitative techniques have been used in the following manner.

(i) \[ D = 1.0746 \sqrt{\frac{A}{N}} \]

(ii) \[ R_H = \frac{r_a}{r_b} \]

The changing patterns of the landscape / land occupied by different socio-cultural groups are carefully examined in sequential manner. The transformation and obliteration of the cultural landscape have been tested within the conceptual frame of histogenesis and morphogenesis.

The spatial diffusion of the clan settlements shows a typical character in which the third stage shows a asymptotic growth of settlement, thus it is similar to By Lund. The coastal like diffusion model is found because of its location.

The dimensional attributes have been applied to test the diffusion stage of the clan settlement and thus the ratio of the settlement velocity, viscosity of the landscape and the energy of the pioneering population have been considered. On the basis of these attributes, generalized models have been presented which may also be comparable to other areas.

For the analysis of the pattern or shape of settlement both qualitative (classical), and quantitative (modern) approaches have been applied. Shapes of settlements have been measured taking ninety villages as a sample on random basis, using the following formula:

\[ S = \frac{A}{\pi R^2} \]

The shape analysis of settlement has also been made by taken into account the number of contacts between a village and its neighbouring villages. Dirichlet / Thiessen Polygons and Hexagon have been used for proper planning of rural settlements.

The composition of building construction and material has been taken into consideration for the classification of rural houses. Social
morphology or spatial patterning of built-up area of selected village of discrete ecological settings at micro level has been analyzed on the basis of religio-ritual and secular dominance models.

Study on “Evolution on Spatial Organization of Clan Settlements in Bharatpur District, Rajasthan” has been organized into seven chapters excluding introduction and conclusions.

The introduction deals with the meaning, scopes, various approaches of the rural settlements, a review of relevant literature and references, importance of study, selection of the area, objective, methodology and the organization of the chapters.

The First Chapter gives the brief introduction of the area, its physical, cultural and demographic setting with emphasis on physiographic, geology, drainage, climate, soil and cultural attributes i.e., land use, cropping pattern, irrigation, transport and communication, manufacturing activities. It also provide demographic structure in the district.

The Second Chapter deals with historical perspective concerning the evolution of settlements of different period taking into account the evolution of settlements in sequent occupancy, the place names analysis, territorial evolution of clan settlement and diffusion of settlements.

The Third Chapter deals with spatio-temporal analysis of various clan settlements of the study area. The dimensional attributed have been applied to test the diffusion stages of clan settlements. Thus, notion of the settlements velocity, viscosity of the landscape and the energy of pioneering population have been considered. On the basis of these attributes, generalized models have been presented which may also be comparable to other areas.

In the Fourth Chapter an attempt has been made to study the spatial distribution of rural settlements. The distribution of rural settlements is affected by several factors in which relief, distribution of resources, population, land under cultivation, types of agriculture development of road network, localization of resources, political decision and cultural bonds are the important factors on the distribution of rural settlements in the
Bharatpur District. The spatial pattern of rural settlements has been studied quantitatively by using quantitative techniques.

The Chapter Fifth examines the various pattern of rural settlement found in the study area in response to the physical and cultural factors. These patterns have been identified on the basis of Survey of Indian Topographical Sheet and have been checked and modified with the help of village cadastral maps and through personal observation, wherever possible. Shape analysis of the villages has been based on quantitative technique taking into account ninety village sample on random basis. Further, relationship among contact index, population density and areal size of the villages have been studied. The present researcher has recommended that the Thiessan Polygon and Hexagon be adopted as model while planning the development of the villages in the study area.

The Sixth Chapter has been devoted to study the rural house types and building material. The Indian villages bounded by agricultural land with different types of building materials and house types in regional settings. Human dwellings are governed by tradition and cultural elements of the time and they form one of the most basic elements in cultural landscape and hold a significant place in the geographical analysis of settlement. House is a symbol regionalism representing social, cultural and economic organization of its people. It also assesses the impact of various physical and cultural factors on the pattern of house and the type of the building material used in the study area. Suitable rural house plan and a few remedial measures have been suggested for improving the village environment.

The Chapter Seventh seeks to analyse the social morphology of three selected villages (built-up areas), based on the religio-ritual and secular dominance models. The influence of caste and dominant landownership on spatial patterning of rural houses of these three selected villages of the district have been examined through field observation.

The conclusions have been drawn and recommendations have been made for the rational planning of rural habitat in the study area.
The different historical records, settlement reports, district gazetteer and field study make it clear that the settlement of this region has begun around 1500 B.C. and in the past the region was inhabited by Matsya tribe before arrivals of Aryans. By the end of the seventh century B.C. the Aryanization of the area has been completed. The region was first affected by the migration wave of Jats clan at the beginning of the twelfth century A.D. and migration of the various corporate groups or clans a much larger scale followed by Muslims invasions in 1195 A.D. a wave of migration continued upto 18th century, each of which has left its imprint upon the study area.

The most visible feature in the cultural landscape is the settlement, and it has been observed the distribution of rural settlement is influenced by various factors. Out of the several physical, social, economic and political factors, a few factors are more responsible for the distribution of rural settlements. However, the settlement distribution is not only determined by the natural condition but also influenced by socio-economic factors.

Four clans, namely, the Sinsiwar Jats, Sogarwal Jats, Chaudhary Jats, Meos, have been analyzed with the help of available literature, field survey and historical records. It has been observed that these clan settlements were diffused over the region by taking time nearly 300-500 years with the three stages of spatial diffusion processes. To measure the diffusion stages, seven dimensional attributes are considered: time (T), distance from parents settlement (L), population (P), number of settlements (n), length of time (S), population energy (p), and lastly viscosity of landscape (V). During the first stage of settlements diffusion process, the founding settlements are recorded in few places due to limited availability of the land and presence of vast jungle, except in the case of Sogarwal Jat clan settlements. In this case vast land was available and so they had established larger number of new settlements.
The second stage of spatial diffusion process mark with the establishment of a number of new settlements. It is due to population concentration and foundation of new hamlets.

The third stage was marked with stratification and competition (the tendency to produce great regularity in the settlement pattern). It has also been recorded that during third stage of spatial diffusion process the number of founding settlements is much less. Since 1800 A.D., nearly all available land was occupied by the clans and they did not establish additional settlements on their fertile land. It has also observed that Sinsiwar Jats have found additional settlements during the third stage of diffusion process due to natural growth of population. A reverse relationship between the distance and population of daughter from parent settlements is recorded: as the distance of daughter settlements from parent settlements increases the population of daughter settlements from the parent settlements decreases and vice-versa. It has been recorded in Sogarwal Jat clan settlements but in other cases such as the Chaudhary Jat clan and Meos clans different relationship has been found. A positive relationship is recorded in the population energy \( p \) and viscosity of landscape \( V \): as population energy \( p \) increases the viscosity of landscape \( V \) also increases. It is due to immigration and presence of market centers.

Caste ranking is determined in the light of population and economic power (landownership). Three village have been taken into consideration. It has been noted that the Jats stands first rank (landownership and population dominancy) followed by Brahmins, Gujurs and others.

The quantitative analysis of spacing of rural settlement at panchayat Samiti level has revealed that there is a direct relationship between spacing and the size of the settlements. It is obvious that where spacing is high, villages are larger sizes, with a small number of hamlets having higher densities of population, which results in compact structure of settlements. On the contrary in areas of low spacing, settlement are generally smaller in size with low pressure of population and scattered distributional patterns, viz., hamlet type of settlements. The nearest neighbour distance
approximation analysis of rural settlement has revealed that settlements are more regular than random.

An analysis of shapes of the villages show that the average shape index of the study area being 0.638. About 17 per cent of the villages conform roughly to rectangular or square shape. No village has a very elongated shape while nine villages approach near circular shape.

Contact index, population density and areal size do not show any significant co-relation with existing almost homogeneous environmental condition in the region.

Transformation of village shape into Dirichlet/Thiesson polygons and hexagons ought to be taken into consideration, while making plans for rural development. It has been found that village sites are mostly determined by physico-cultural factors where as markedly centres have developed at the intersection of roads or along the roads. As the number of markets centres increase the services area of individual market centres decreases. Increasing Christaller's K values may be taken as an index to represent better efficiency of purchasing power and development on the one hand and transport connectivity of a region on the other, which should be taken into account while makings plans.

The morphology of rural dwellings in the study area shows that the building materials and the architectural style are the expression of the physical factors of the region, whereas the ground plans are closely related to the socio-economic conditions of the residents. Mud or clay, is widely used in the district, because plenty of cheap clay is on hand to construct walls and roofs. The size of the dwelling reflects the economic conditions of the dwellers.

The social morphological study of three selected villages (built up areas) reveals that the economic power of the people and caste plays a decisive role in the selection of best available site for settlement. The analysis of the spatial patterning of rural dwelling of different caste shows that segregation is closely associated with caste inhabited in the villages.
To improve the living conditions of the rural peoples and their settlements, it is important to comprehend the socio-economic condition of the people and the potential resources of villages. The rural settlements are tradition bound and its nature of built up area is spontaneous. They are closely knit together through invisible thread of social fabric, and interdependent to one another to carry out their socio-economic business. Breaking of joint family system, pattern of existing dwellings, fragmentation of land holdings, social conflict are some of the cause for haphazard growth and mushrooming of settlements in countryside. In view of the above facts some of the important suggestions based on field experiences have been made to obtain the sustainable development of the countryside. These are as follows:

1. In order to improve housing conditions, house should be simple in design. Bricks that can be locally manufactured at the same time generating local employment can replace mud walls.

2. The congestion of houses may be relieved by providing extension site for them. This can also be achieved by filling up the stagnant ponds and pits lying near the settlement sites. These pits and ponds served useful purpose in medieval and ancient days but now they are turned into breeding grounds of mosquitoes.

3. All the villages and hamlets should be connected with brick line road with a view to maintain cooperation among the different sections of the society and improvement of their socio-economic conditions.

4. The sewage system needs improvement by providing soak pits for individual houses and pucca drainage for the streets, but both should be cleaned periodically.

5. Cattles pens and sheds should be keep little away from the dwelling sites attached to it with a view to good sanitation.

6. There should be provision to dry latrines near the inhabited sites to avoid the unhygienic practice of defecating in the open field.

7. Extension of safe drinking water through more tube-well installations.
8. Electric connections should be extended to every bit of the region.

9. Provision of better education, health facility for all and popularization of family planning measures, so that dependency burden on worker can be lessened.

10. Schemes for developing pisci-culture, dairying and poultry farming have been suggested.

11. The illegal gathering of forest produce should be regulated by introducing social-forestry, small scale industries or handicrafts generating rural employment and income.

12. Lastly, planning will be facilitated if further research in oriented to find out the process of human adjustment to environment.

National and International development policies are giving higher priority to distribute the benefits of development to the poor and other disadvantaged, through a combination of accelerating overall growth and disintegrating more of the benefits directly to those groups. For the development of human settlements the available resources should be used efficiently and to its optimum level to provide jobs, goods and services to the needy people of the rural areas; since poorest of the poor lives there. National and International development efforts seek to increase agricultural output and rural employment and incomes, the spatial focus of settlements policy must expand to include rural settlements as well as urban settlements. One way or another, the inhabitants of rural settlements should be provided with at least minimal facilities for safe drinking water, primary health care, education, marketing and storage facilities for agricultural produce and inputs and opportunities to earn enough income whether in cash or kind, to provide adequate food, clothing and shelter. In addition, national settlements policies and plans should strive to provide the rural population with access to a wider variety of occupations and cultural facilities so that ambitions, educated rural people will be able to find challenges and rewards commensurate to their abilities.
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Fed in Computer

14 AUG 2006
This is to certify that Mr. Mohammad Danish has pursued his research work and prepared the present thesis entitled "Evolution and Spatial Organization of Clan Settlements in Bharatpur District, Rajasthan" under my supervision and guidance. This thesis is his original work and is being submitted to the Aligarh Muslim University, Aligarh for the award of the degree of Doctor of Philosophy.

(Dr. Ateeque Ahmad)
Supervisor
ACKNOWLEDGEMENT

I owe a deep debt of gratitude to my supervisor Dr. Ateeque Ahmad, Department of Geography, Aligarh Muslim University, Aligarh, under whose valuable and inspiring guidance this work was carried out. He took a keen interest in guiding me at every stage of this work and I owe for his suggestion.

I should place on record my thanks to Prof Azimuddin Qureshi, Chairman, Department of Geography, A.M.U., Aligarh, for extending to me all the departmental facilities.

I am very grateful to my parents, brothers and sister who have given me constant encouragement for the completion of this work.

I thank all my colleague and friends Dr. F. Rahman, Mr. Kausar Shamim, Mr. Saeedur Rahman, Mr. M. Abid, Mr. M. Hasan, Mr. Muzammil and Mr. Junaid N. Shah for being affectively helpful.

I am also thankful to Dr. Irfan Sabir for his valuable help in cartographic work. In last, I am thankful to Mr. Abid Jamal Siddiqui for word processing.

MOHAMMAD DANISH
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INTRODUCTION
Settlement is visual imprint made by man upon the physical landscape. It is manifestation of physio-cultural and socio-economic condition of the region. As diverse physio-cultural, socio-economic conditions are found in different parts of the region, so it is obvious the diverse system and pattern is supposed to happen. The settlement is not grown in single point of time but it takes long interval of time. During its process of growth many more changes are found in their morphology, shape, structure, layout, plan etc. It is brought through different waves of social stock within the region. The region remained under the sway of many dynasties and each one tried to put their own imprint upon the physical landscape in accordance with their cultural norms of the society. These changes are apparently seen in the place-names of the area. Such kind of study is very helpful to know the exact ecological setting of the past and how they contributed in evolution, nature and spread of settlements.

The geographical study of rural settlement begins with Ritter's work in the early nineteenth century. Since then both the content and the methodology of the study have been developed principally within the German and French, while in England rural settlement geography is a relatively recent branch of human geography. Stone suggested that 'geography of rural settlements is defined as the description and analysis of the distribution of buildings by which people attach themselves to the land for
purpose of primary production'. But he excluded some significant constituents like building materials, architectural styles, land use and fence types. A year later, his ideas were challenged by Jordan who defined settlement geography is the study of the form of the cultural landscape involving its orderly description and attempted explanation. Later on he emphasized three aspects of the cultural landscape: (i) the settlement patterns or distribution of farmsteads, (ii) the field pattern, or the form resulting from division of land for productive use, and (iii) house and farmstead type including the building materials and folk architecture.²

R.L. Singh is of the opinion that settlement geography deals with the facilities built in the process of human occupancy of land and their grouping. The nature and distribution of these facilities are related to the art and mode of living on the one hand and to such physical factors as water supply, slope, forest and swamps. These are designed and grouped to serve specific purpose, and carry functional meaning. Houses and highways, the two basic facilities of settlement, are the topographic expressions of their grouping. The external forms reflect architectural style of their time and they reflect changes in human occupancy of an area, after being the only relict of expressions of the past cultural landscapes.

Settlement is an organized colony of human being, including the

buildings in which they live or work or store or use them otherwise and the tracks or streets over which their movements take place. It is either rudimentary forms as expressed by the temporary camps of the hunter or the herder, including the one-wall houses of Semangs of Malaya or the giant building like sky scraper, reflect some human ingenuity and the influence of the environment. Thus the centre of interest in settlement geography is man and the reciprocal relationship between human occupance features and environment.¹

Settlement geography, a recent sprout from the venerable trunk of human geography was mainly concerned with urban settlements before the turn of twentieth century.² But, since about two-third of the world population and about 66 percent of the total settlements occupy rural area. Many historian, sociologist and geographers have studied rural settlements and the problems attached with environmental aspects in rural areas. Even urbanized world still possesses varied forms of rural settlements. Thus, a comprehensive study of settlement requires explanation of site and situation, building materials, forms including architectural style, function types and patterns, and characteristics. Of these, site and situations and material need full

interpretation of physical and cultural linkage while morphology requires in-depth study of sequent occupance involving historical background. As the past is the key to the present and we walk to a certain degree in every village among the ruins of antiquity,¹ that involves archaeological analysis to understand the ground reality. The place-names study serves remarkably in reconstructing the sequent occupance.

The subject matter of settlement geography varies from herder's hut in a pioneer fringe to a skyscraper in New York. The totality of the human community in rural areas include the social, material organizational, spiritual and cultural elements are necessarily required for sustaining of human living. Under physical requirements as housing, work, energy supply, transport communication, water availability, education, health, protection and social welfare, system of territorial organization, local self-government, law and economic management and cultural facilities for the development of art, recreation and leisure come under this study. Further, with the growth of population, increasing migration rural to urban areas and vice-versa, the demand for house construction for rehabilitation of displaced persons form natural and human born calamities such as earthquake, flood and sense of insecurity caused by insurgency, communal violence etc are

developing wider scope of rural settlement studies which requires an integrated approach for rational planning and development.

**Approaches of Rural Settlement Studies**

Three basic approaches of studies are employed in rural settlement geography.

**Genetic Approach**

The genetic approach of settlement study was pioneered by Meitzen (1895). In the 20th International Geographical Congress Symposium (London, 1964), it was emphasized that the scientific study of settlement must be found on an appreciation of the nature and limitation of historical perspective, whether archaeological or documentary. As the core concern of settlement geography is the spatial arrangement and sequent occupance, the histogenetic approach is most appropriate for studying the degree continuity of territorial organization and problems of interaction between man and environment. Three basic attributes, i.e., retrogressive, retrospective and prospective are very common for historical perspective of rural settlement studies. Bloch advocated the first attributes in this context. According to him, retrogressive method is focused upon the past on the basis of the evidence gathered from the recent past.¹ The second approach, i.e., retrospective, advocated by Roger Dion focuses upon the present, the past

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condition regarding settlements being considered for better understanding of the existing state.\(^1\) The third approach, i.e., prospective, concern itself with the future, the past and present settlement forms being regarded as relict feature adjustment with future probable needs.\(^2\)

Study of settlements on the basis of diffusion theory is also a significant approach followed by various geographers. Analysis of abandoned settlements, a new approach, provides conclusive evidence about the past settlements and human activities. This approach developed out of archaeology, it consist of three parts: (i) chemical analysis of soil phosphorous indicating human occupancy, (ii) micro-separation examining soil and settlement components primarily through mechanical means and (iii) polynology (pollen analysis). Eidt presented interesting finding in his studies.\(^3\)

**Spatial Approach**

Spatial organization approach is a form of system approach, which help in comprehending the settlements as a whole. It may be analyzed through different concept, among which very pertinent in rural settlement geography are (i) type, pattern and classification

\(^{1}\) Dion, Roger (1949), ‘La geographica humanie retrospective’ catriers Internationaux de sociologia’, pp. 3-27.


(ii) functional integration and hierarchy, (iii) local identity (e.g. village structure) and (iv) planning and rationalization. Demangeon actually developed the concept of spatial organization in context to morphological structures. He presented the classification of French settlements into different types based on its shape. His works paved the way for the geographers to produce regional classification of rural settlements into different types. Schaefer initiated the modern orientation following the work of German Geographers. Modern geographers are following him in the study of settlements through the analysis of patterns and processes as they express the spatial organization in environmental space. Through this approach the interrelationship of man, nature and society is better expressed in any cultural landscape. A number of studies on morphology, size and shape of settlements speak some sort of organization of space ranging from a room, hamlet, town to the far of settled megalopolis.

Ecological Approach

The ecological-cultural approach finds its strength through the study of plant ecologist. Plant ecologist theories are being applied to explain the process of change in human behaviour and settlements over time. Radha Kamal Mukherjee regarding
adaptation of human society and ecology produced a fundamental work.\textsuperscript{1} The settling process as described by Hudson\textsuperscript{2} included three phased colonization, spread and competition similar to plant communities in space. He concluded that this process follows a cycle way temporarily. Since much of the human behaviour is of sub-optimal nature,\textsuperscript{3} people in various habitats are often with less than the ideal. Such habitats have been studied by many geographers including Kayastha\textsuperscript{4} and Singh.\textsuperscript{5}

The most significant theoretical framework of settlement formation has so far been developed by C.A. Doxiadis.\textsuperscript{6} He sets five principles, illustrated with hypothetical diagrams (Fig. i). The first principle is the maximization of man's potential contact with natural elements (e.g water, trees etc.), with other people cultural elements (e.g buildings, roads, etc.). The second principles is the minimization of efforts required for the achievement of man's actual and potential contact, according to the general principle of least effort. The third principle is the optimization of man's protective space at every movement individually or in a group, in

\begin{itemize}
  \item Mukherjee, R.K., (1940), Man and His Habitation: A Study in Social Ecology, London.
  \item Hudson, J.C.,(1969), A Location Theory of Rural Settlements, AAAG 59:365-381.
  \item Pred, A(1976), Behavior and Location, Lund Studies in Geography, Series B.No. 27, p.28.
\end{itemize}
FIVE PRINCIPLES OF SETTLEMENT-FORMATION

1ST. MAXIMIZATION OF POTENTIAL CONTACTS
Given certain conditions in a certain area, man will select the location which allows a maximum of potential contact.

2ND. AT A MINIMUM OF EFFORT IN TERMS OF ENERGY, TIME, AND COST

3RD. OPTIMIZATION OF MAN'S PROTECTIVE SPACE IF HE IS ALONE

4TH. OPTIMIZATION OF THE QUALITY OF MAN'S RELATIONSHIP WITH HIS ENVIRONMENT

5TH. OPTIMIZATION IN THE SYNTHESIS OF ALL PRINCIPLES

The five elements of human settlements are now out of balance.

Fig. 1
any situation or locality, whether it is temporary or permanent, whether he is alone or part of a group. The fourth principle is the optimization of quality of man relationship with his environment, consisting of nature, society, shell (building and houses of all sorts), and networks (lanes, street, road, communication, etc.). The fifth principle is that man organizes his settlements in an attempt to achieve an optimum synthesis of the previous four principles. This optimization works naturally through time and space, as well as the prevailing conditions and man's ability to create a synthesis.

Apart from space articulation or territoriality, there are also other pertinent factors, which are capable of general application. Doxiadis has developed a four fold frame which can be applied to composite individual settlements of all size and a territory as well as to its constituent (Fig. ii). Hypothetically, any settlement consists of four parts: (i) homogenous part (ii) central part (iii) circulatory part and (IV) special part. These parts are always subject to change but are always present in a living settlement.¹

REVIEWS OF WORK DONE SOFAR

The study of settlements goes back to ancient period. Most of the Greek scholars observed the habitats of the people and associated with their culture. Herodotus² (440-25 B.C) made

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PARTS OF HUMAN SETTLEMENTS

ANY SETTLEMENT CONSISTS OF:

- Homogeneous Part
- Central Part
- Circulatory Part
- Special Part

A VILLAGE CONSISTS OF:

- Homogeneous Part (Fields)
- Central Part (Built Up)
- Circulatory Part (Roads and Paths)
- Special Part (Temple)

THE BUILT UP AREA OF THE VILLAGE CONSISTS AGAIN OF:

- Homogeneous Part (Houses)
- Circulatory Part (Street)
- Central Part (Shops)
- Special Parts (School or Temple)

Fig.11
cursory observation of settled places, customs and tradition of their inhabitants of the known world.

A few references to the town and cities are found in the book of Starbo (63 B.C - 20 A.D)\(^1\). The geographical study of rural settlement in modern context began with Ritter's (1779-1859) work.

Moser\(^2\) (1780) makes an important methodological contribution to settlement analysis after carrying out field investigation of life in northern Germany he describes individual farm houses and the functions of farm structure and fields, as well as the influence of tradition on settlement pattern.

Arnold\(^3\) (1875) states that place names and history are important for establishing the order of settlement stratification, and it provides an indirect basis of assessing the factor in the location of the villages.\(^4\)

Finch and Trewartha (1942) mention a number of factors, which determines the pattern of settlements like topography, elevation and slopes, nature of soil, forest, existence of springs.\(^5\)

Stanislowsky (1946), states that Latin Planning methods were later

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3. Arnold, W., Ansiedlungen Und Wanderungen deutscher stamme Zumieist nech Hessischem Ortsnaman Marburg, (1 875).
extended to the new world by the Spanish and the Portuguese who had centuries of experience and operating vilas, pueblos and Ciudades from Roman Structures.¹

Blache (1952) has found that the concentration and dispersion are the results of physical influence on human environments.² He further states that human being select sides to contact between different geological formations and varieties of topography give new and favourable opportunity for their settlement. There is a marked tendency to converge or even to concentrate at the angles of slopes or at the intersection of different gradients.³ Again he says that the agglomeration of settlements itself becomes a locational force for the establishment of settlement.⁴

Ahmad (1952) made a commendable study of the rural settlement types in Uttar Pradesh. He grouped the rural settlements into compact, semi-compact, fragmented or hamleted and dispersed. He observed that religious belief and superstitions also exert pressure on the location of rural settlements in the Ganga Yamuna Doab. Villagers generally avoided a new site for a house as far as possible. Houses can be built on a new site only after the sanction made by the priest. Moreover the ancestral site

3. Ibid., p. 238.
4. Ibid., p. 281.
of a house is usually regarded as sacred unless the family is in
decay. Extension of a settlement on the south and west is
forbidden, these two directions being considered inauspicious.¹

Brunhes² (1952) identifies settlement pattern by using the
term 'nucleated' instead of 'compact' whereas Blache and Finch
called it 'clustered' and 'Compact' respectively.

Anas³ (1954) has found that village and hamlet tend to avoid
the low laying areas liable to inundation and seek dry points on
some mound or elevated piece of land.

Mukerji⁴ (1954) has discovered that clan solidarity of Jats
and Gujars have held them together on compact sites. The Jats
have everywhere captured the best lands. Their farms have the
best soils and are located in first assessment circles adjoining the
villages.

Clark and Evans (1954) have devised a new quantitative
technique to examine the pattern of rural settlements.⁵ This is
called the nearest neighbour technique.

1. Ahmad, E., Rural Settlement Types in Uttar Pradesh, Annals of the
3. Anas, M., The Pattern of Human Settlement in the Sub-Himalayan Region
4. Mukerji, A.B., Jats: A Study in Human Geography, Geographical Review of
India, Vol. 16, No. 2, June (1 954), pp. 18-19.
5. Clark, P.J. and Evans, F.C., 'Distance to Nearest Neighbour as a Measure
Buschman\(^1\) (1954) investigated the inter relationship between the settlement patterns and the house types in different regions of India.

Singh (1955) has gone through temporal analysis of village pattern and says that when one speaks of the village plan one refers to the layout of a basti (inhabited site) resulting from the arrangement of houses and village streets or lanes.\(^2\)

Singh (1955) has also analysed the spatial pattern of the society and culture, particularly with emphasis on clan organization against the geographical background, which has been further elaborated in his later works. He has tried to trace the progress of some Rajput clans from their migratory stage to settlements.\(^3\)

Thomson (1956) has applied the nearest neighbour technique in his study of the distribution of population.\(^4\)

Bhattacharya (1956) made a study of settlement patterns in the Upper Ganga Plain of Uttar Pradesh and attributed agglomerated pattern to caste affinities.\(^5\)


\(^3\) Ibid, pp. 70-14.


\(^5\) Bhattacharya, N.D., 'Rural settlements of Murshidabad West Bengal', *The National Geographical Journal of India*, Vol. XII, 1954, p.4,
Bradford (1957) focuses on settlement planning and says that Romans were much interested in it and had evolved a well-organized quadrate system.¹

Finch and Trewatha (1957) define the nucleated settlement as those which have all the dwellings of a mauza concentrated in one central site to form compact settlements, houses being clustered with each other. They called these settlements 'nucleated' or 'compact' while Blache calls them 'clustered'² He also says that there is a close relationship between the relief features and the location of rural settlements and that dispersion increases in direct proportion to the raggedness of the surface of the land.³

Bertrand (1958) observes that the strong kinship relationships are major characteristics of the social structure in many rural areas of the USA. Individual section of a dwelling site is primarily influenced by the location of the residence of another number of the family.⁴

Blache (1959) calls concentrated dwellings of a mauza is one central site of a compact settlement.⁵

Singh (1961) defines settlement as an occupancy unit representing an organized colony of human beings including the buildings in which they live or work or store and the tracks or

2. Finch and Trewartha, op. cit., p. 548.
3. Trewartha, op. cit., p.545.
streets over which their movements take place. Even their rudimentary form as expressed by the temporary camp of the hunter or herder including the one wall house of the Semangs of Malaya reflect some human ingenuity with an imprint of the environment.¹

Yonekura (1961) made a comparative study of the rectangular village pattern in South India and Japan, and concluded that no single natural factor decides the village patterns. Regarding India's Villages he observed that they are generally agglomerated in type like that of East Asia.²

Bose (1961) observes that as such a settlement does not have any particular shape, it is known as irregular or amorphous. He called such a pattern a shapeless cluster.³

Ahmad (1962) states that villages differ greatly from one another in shape and pattern by reason of contrast in the arrangement of streets and houses. As a matter of fact, the street system within a settlement is most essential element. When houses are built in groups, the street often plays the decisive role and the houses face is neither the east nor the west but towards the highway the street or the road, Besides the street system other

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cultural elements such as a temples and mosques give a peculiar character to dwelling site.¹

Dacey (1962) focuses his attention on settlement he adopts the Nearest Neighbour Distance techniques.²

Chisholm (1962) observes that the religious minded have staunch faith in the existence of God or Deity, which sometimes is the basis of all settlements.³

Ahmad (1962) says that village ponds are great sources of water supply for drinking purposes for the cattle. Construction of house and minor irrigation facilities in the nearby cultivable land. There is hardly a village without a pond in the entire Doab region. Ponds are centres of rural activity where women come to fetch water and men to water their cattle. A few trees are grown near the ponds to provide shelter against the scorching heat of the sun. Thus these ponds become ideal, places round which settlements were situated.⁴

Ullman and Dacey suggests that large centres have a far greater range of services and functions than smaller ones.

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Relationship between size and functional range is curvilinear. With each new addition in population new functions are added.¹

Kirk. H. Stone, (1965) defines settlement Geography is the description and analysis of the distribution of buildings by which people attach themselves to the land and calls for a focus of attention on where the buildings are they and why are they there.²

Jones (1965) states that the pattern of settlement is determined on the basis of the location of houses and the highways. This shows the shape of a settlement. Villages represent a sort of growth within the physical and cultural setting of a region. The pattern of settlement exhibits the relationship between one dwelling and the other. Sometimes is irrespective of site, often the pattern is unrelated to site. The site may also have no bearing on pattern.³

Dube, (1965) pointed out that from times immemorial the village has been the basic unit in the organization of Indian social polity. Yet the Indian village community cannot be regarded as static. Time and the interplay of historical and sociological factors have influenced the structure, organization and ethos of these communities in many significant ways.⁴

Haggett Peter¹, (1965) found that time is an important factor in determining the locations of settlements. With the lapse of time development have been taking place according to a variety of reasons, social, political and economic which have a direct bearing on human settlements.

Jones, (1965) observes that the location of a village is the expression of a combination of physical and cultural factors operating in the area concerned.²

Jordan, (1966) modifies the definition of settlement morphology (synonymous with "form of the cultural landscape") and adds that "description of the form should come before explanation". He defines settlement morphology in terms of vertical and horizontal dimensions as well as materials composition.³

Perpillou, (1966) says that water supply is one of the most important and paramount factors in determining the location of rural settlements. Water being most necessary to men, animals and corps, man settles where it is available easily and in large quantities.⁴

Jan and John, (1967) found that settlement pattern denotes the shape or arrangement of settlement in relation to natural or

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man made features or designs such as streams, ridges, canals and roads.\textsuperscript{1}

Doxiadis, (1969) has given a theoretical framework for the formation of settlements. In this regard he sets forth five principles. The first principle is the maximization of man's potential contacts with the natural elements (water, trees). The second principle is the maximization of the efforts required for the achievement of man's actual and potential contacts. The third principle is the optimization of man's potential space at even movement individually or in a group. The fourth principle is the optimization of the quality of man's relationship with his environment consisting of nature, society, shells & networks. The fifth principle is man's organization of his settlements in an attempt to achieve an optimum synthesis of the previous four principles.\textsuperscript{2}

Hudson (1969) makes a study of the arrangement of dwellings in north eastern Georgia and some rural areas of the United States. It is clear that ideas of individual members of a family and other attitude, towards ideal locations have a direct bearing on the arrangement of dwellings.\textsuperscript{3}

\textsuperscript{3} Hudson, J.C., ' A Location Theory for Rural settlements' \textit{Annals Association of American Geographer, Vol. 59, 1969, pp. 365-381.}
Mukherji (1970) has studied the cultural geography of Jats and has succeeded in tracing stages of Jats migration with emphasis on the origin, settlement pattern and nomenclature of their villages.¹

Singh (1971) has presented hypothesis regarding settlement pattern. According to him religions ritual norms of the Hindu Society lead to the maximization of Socio-Spatial distance among the different caste groups. While the secular norms of behaviour, which are based on functional expediency, lead to the minimization of these distances.²

Tiwari (1972) mixes rural settlement geography describing how the settlements are influenced by the rural landscape as well as by relationship as regard other aspects of rural life such as religion, rituals and social structures, economic functions as well as demographic characteristics.³

Nitz (1972) makes stimulating effort at evolving an outline and methodology for studying the evolution of rural settlement, using a comparative approach and making use of written records, archeological evidence, place names and field patterns. Nitz also pleads for the use of genealogical trees of rural families for

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reconstructing settlement processes and evolution of field patterns.
He further suggests that settlement genesis can be worked out by
dating the periods with the help of place names.¹

Sharma (1972) says that houses and house types reflect with
great exactitude the inter-relationship between man and his
environment and tell about man's struggle for shelter through time
and space. The study of house types is necessary as well as
fascinating. The house is man's first step towards his adjustment
to his environment. The house is man's first step towards his
adjustment to his environment. The site of a house has a direct
bearing on man's occupation. Water is most necessary to man,
animals and crops. Man takes shelter where it is available easily
and in large quantities. Religion is another major factor underlying
the form, spatial arrangements and orientation of house.²

Nitz (1972) asserts that a kind of historical spatial settlement
stratigraphy has been developed by name change analysis and this
technique should be applied routinely in much settlement
investigations.³

Sharma (1972) has used intervening distance analysis for
spacing in an Indian desert on the basis of the formula given
below.⁴

¹. Nitz, H. Objectives and Methods of Geographical Research in the Evolution
². Sharma, R.C., 'Settlement Geography of the Indian Desert', New Delhi,
Sharma in a further study says that roads play important role in the location of a new settlement and also in increasing the importance and size of a preexisting settlement. In many cases recently, with the introduction of regular bus transport, road have acted as a factor promoting the growth of twin village settlements.¹

Bhala (1973) studies the patterns of settlement and it led him to identify topography and social group as an important determinants.²

Brook and Webb (1973) have found that aggregation of population and the growth of village have been closely favoured by conducive factor like agriculture, water supply and mutual, social and economic needs. Density of a settlement results mainly from the degree or intensity of land use. Besides according to them, close social relationships and warm neighbourly feelings of the village community and cooperative agricultural practices have strengthened the traditional cohesive character of the settlements in the Ganga Yamuna Doab.³

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1. Ibid, p. 104
Singh (1973) has identified compact, semi-compact and hamlet types of rural settlements, and correlates the types on the basis of the well known physiographic and cultural factors.¹

Mukerji, (1974) says that rural settlement studies have for a long time shown a greater concern for types and patterns then for other attributes. He has given another attribute- spacing of rural settlements. With the help of a formula spacing may be easily calculated.

\[ S = 2x \left( \frac{A}{N} \right)^{\frac{1}{2}} \]

S, represents spacing, A represents the area of study and N is number of rural settlement. Finally he has drawn the conclusion that there is a positive correlation between low productivity, low density of rural population, small villages and wider spacing.²

Mann (1974) describes the structure of rural settlement by applying the means of settling processes with reference to the role of socio-historical forces in their formation and function.³

Mann (1974) also examines attributes other than morphology to known the spatial variation in the size of settlements. According to him, there are three parameters-population size, areal size and number of occupied houses

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independently of spacing. Need for defence, cultivated area and transportation network are also related to the population size of the settlement.¹

Mukerji (1974) stresses that the site, situation and location are important attributes of the rural settlements, playing their role in morphological evolution as well as in socio-spatial structure.²

Sen (1974) observes that site, situation and location are no doubt important attributes of the rural settlements. For example, people change their site in response to flood hazards. He also provided a fruitful guideline for studying the factors involved in the decision-making processes of a community for maximizing the futility of a site not merely in terms morphology but also of function.³

Singh, R.L and Singh, R.B. (1975) have studied the morphogenesis of Indian Village with reference to a Rajput clan in Middle Ganga Valley.⁴

Bhattacharya (1975) correlates the settlement patterns of Deltaic West Bengal with physiography and agricultural land use. He has also worked out a convincing correlation of settlement

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pattern with micro-topographic variation. He asserts that deltaic settlements of the Middle Ganga Valley are not applicable to deltaic regions.¹

Singh, Rana (1975) suggests that varying degrees of regional and local dominance and sub dominance in any sphere, either caste, numerical, economical, educational, cultural or political, influence the settlement pattern.²

Edwards (1975) has studied Iberian settlement activities in America through questionnaires called Pelaciones Geographicas and in the ordenanzas de poblaciones of the codiendo de India's.³

Hassan (1975) focuses his attention on functional analysis and has found that settlements generally present a good example of human adjustment to the geographical environment. So that fauna, flora, terrain, water bodies and climate, all have their impact on human culture.⁴

Singh, R.L. and Singh, R.B (1978) have found that old settlements are associated with physical features like rivers, because the earliest settlers followed the main watercourses and their tributaries upstream. Such findings appear valid in many

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pioneer zones of the world and even for landscapes, which have been quite altered with the passage of time.¹

Hassan (1980) says that geopolitical and national ideology have guided both pre-1948 and the post-1967 Jewish frontier settlements in Israel. According to him, each settlement stage was characterized by penetration into remote areas on the periphery of older established communities. In order to comprehend the development of Jewish frontier settlements three factors must be taken into account the historical geographic situation, the method of settlement and the spatial network of the settlements themselves.²

Berensten (1982) says that settlement pattern in the Federal Republic of Germany has undergone changes along democratic lines since 1945 due to the new policy of the Government. Greater impetus has been given to the rural areas and this has led to the stability of small rural centres at the expenses of larger urban centers, which has brought about changes in both urban and rural areas, affecting the pattern of settlements.³

Johannes Auget (1982) asserts that the politico-economic factors must be taken into consideration regarding the condition

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of rural settlements.\textsuperscript{1}

Singh (1983) have studied the hierarchical systems and spatial patterns of central places in Baghpat tehsil on the basis of population size, central functioning and amenities available among rural settlements in the tehsil and the district.\textsuperscript{2}

Nag (1984) have studied the evolution of Zambian settlements and planning in order to develop continuum of settlements, to check rural urban migration, discourage squatter settlements, organize the country through settlements and highlight the possible trend for future settlements.\textsuperscript{3}

Grover (1985) discusses the evolution of the Kanet landscape by selecting a sample village Behlon in the Morni Hill of Siwalik range in the state of Haryana. It is believed that Kanets belong to the Rajput caste having a distinct identity to their own. The Kanet settlement may be located as a caste territory on a Kanet cultural area since they are dominant in terms of numerically and land ownership.\textsuperscript{4}

Doxiadis's definition was given a new shape later in 1987 by Alexander B. Leman, who proposed a second definition, "human settlement are spatial / operational arrangements made by

\begin{itemize}
\item \textsuperscript{1} Johannes Auget, Human settlement Problems in Brazilian Development, Ekistics, Vol. 49, N6.292, Jan-Feb. (1 982).
\item \textsuperscript{3} Nag, P.,' Geography of the Zambian Settlement", Philippine Geographical Journal, Vol. XXVIII, No. 3 & 4, 1984, pp. 110-17.
\end{itemize}
humans within certain scales, in order to support life and to pursue their aspiration, goals and targets.¹

Nag (1990) has discussed findings of Zambian settlements. He has studied spatial analysis and growth of population, rural development, urban settlements and urbanization, housing and squatter settlement, in detail supported by suitable quantitative settlement analysis.²

Gill, M.S. (1991) observed that the centuries old compact village in Punjab are gradually moving towards dispersion because of some factors like the enhanced feeling of security, rapid economic growth, acceleration in the rate of population growth, rapid rise in aspiration levels specially among the younger and educated people and lastly gradual spread of urbanism.³

Singh (1996) had identified the rural settlement of Saryupar plain as compact, semi-compact, helmeted and dispersed settlements on the basis of various physico-cultural and socio economic factors.⁴

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Ahmad, A., Hameed G. (2000) have applied the nearest neighbour technique in Meerut District in Uttar Pradesh to find out the spatial pattern of rural settlements and their variation.¹

The analysis of evolution and spatial organization of clan settlements in an ancient settled region like Bharatpur District is a difficult task, due to the complexity of successions, absorptions and interruption by later settler on the one hand, and lack of adequate data and records on the other hand. However, an attempt has been made in present work to trace the evolution and spatial organization of the clan settlements in Bharatpur District, with the help of the available sources and field studies.

Archaeological excavations at various sites of the region have shown that settlement of this region has begun around 1500 B.C. The earliest remains i.e., pottery belonging to the Late Harappan period have been found in Aghapur. Then successive cultural remains of different period have also been recovered from different places in the region. Though it is not possible to trace the successive evolution of settlement in early historical period, it is almost certain that the region was occupied by pre Aryan people during prehistoric time. The district close to Mathura in the east and to Bairath in further west, lends to the area an antiquity of epic age when Matsya inhabited this region. This tribe is

mentioned in the Rigveda along with other Aryan tribes.\textsuperscript{1} It is flourished as a Mahajanpada in the time of Buddhistic Anguttara Nikava.\textsuperscript{2} It may be summarized that their society was mainly rural, based on agriculture economy. They must have cleared the vegetation along the tributaries of the Parvati, Chambal and Ghambhir rivers to settle in this region. They must have made their colonies and named these after the name of the chief of their tribes or clans. The dwellings in their settlements were made of wood of bamboos and they do not differ much from those found in the study area even today. By the end of the seventh century BC the Aryanization of the area had been completed. The region was at first affected by the migration waves of Jats clans at the beginning of the twelfth century A.D. and migration of various corporate groups or clan on a much larger scale followed by Muslim invasion in 1195 A.D. Since a wave of migration continued upto 18\textsuperscript{th} century, each of which has left its imprint on the district area. A distinct socio-economic and cultural and those has emerged in it. It is rather difficult to trace the patterns of ancient and medieval settlements until extensive excavation have been conducted, which is impossible on account of the high density of population in the region. So the existing rural settlements have been taken into spatial analysis.

\begin{itemize}
\item \textsuperscript{1} Bhargwa, M.L., 'A Geography of Rigvedic India', Lucknow (1964), p. 50.
\item \textsuperscript{2} Law, B.C., 'Historical Geography of Ancient India', Paris (1964), p. 42.
\end{itemize}
It is observed that, throughout the human history the settlements have evolved in relation to topography and resources of the area. The majority of the people of the region live in villages. This is a clear indicator of agriculture development and stability on the fertile land. Initially people lived in scattered hamlets, and later they clustered together in favourable spots either along the water courses or highways, which gave rise to the compact village type. Several historical and physio-culture factors such as better means of transportation and communication, efficient irrigation facilitates and improvement of socio-economic condition of the people together with the increase of the population have been the main factors of the clustering of human habitats in many parts of the region. In contrast to the compact type, there is the scattered type of rural settlements occurring in infertile tracts, usar infested areas, and areas with poor irrigation and transport facilities in the district.

The study area, Bharatpur District, is one of the most early settled region of the country involves interesting pattern of human congregation for which it has been purposively selected for making a humble contribution to growing field of settlement geography. The district has an agrarian base and present diverse physio-cultural and socio-economic condition at micro-level in its different parts. It is one of the most ancient settled region and has long history of peopling and occupancy. Several archaeological findings,
historical records and local legends pertaining to the pre-historic
time, show that the study area was initially occupied by Matsya
tribe before the Aryans. Inspite of the intermixing of various ethnic
groups and cultural traits from within and outside the area has
preserved its own traditions, culture, myths, norms and values,
which has resulted in shaping the uniqueness in its identity. It
may also be added that no serious study on the evolution and
spatial organization of clans settlements has been made so far in
the district.

Objectives

The objective of the present study is an analysis of the
various aspect of the evolution and spatial organization of the clan
settlements in Bharatpur District. So as a first step, an
understanding of certain issues becomes inevitable.

1. To study the physical, cultural and demographic parameters
   that give rise to variation in the macro and meso region of
   the study area, as base for human settlements.

2. To trace the evolution of rural settlements from pre-historic
to modern period with the help of cultural ecology and place
names analysis.

3. To examine the spatial organization and transformation by
   successive social groups or clans.

4. To deal with some salient characteristics of a few models of
   spatial diffusion.
5. To study the spatio-temporal analysis and diffusion of clan settlements.

6. To examine the caste structure which plays a significant role in the formation of socio-economic hierarchy.

7. To interpret the distributional pattern and inter-relationship among the rural settlement with the help of size (population and size), spacing (observed, expected and index of randomness) and other characteristic, through these findings an attempt has been made to measure the degree of concentration and dispersion to classify the rural settlements in different types.

8. To deal with the view of the shape analysis as well as the geometrical form of shapes, and to study the factors responsible for the formation of various pattern of rural settlement.

9. To study the morphology of dwellings on the basis of size and building material and suggest a suitable house plan for the district.

10. To analyse the social morphology of the selected villages (built-up areas) based on the relegio-rutual and secular dominance models and also to examine the influence of castes and dominant landownership on the spatial patterning of rural houses in the study area.
11. Finally, to summarize all the observations made during the course of study and the net results thereof.

**Methodology**

In order to analyze the evolution and spatial organization of clan settlements in Bharatpur District, there are so many sources which are extremely helpful in providing significant clues to the understanding of the evolution of clan settlement in the district e.g. archaeological findings, historical sources, various written records, place names, culture, cults, folk-lore, maps, field survey and interviews.

Archaeological evidences consisting of earliest remains i.e. pieces of Ochre coloured pottery (OCP), black and red ware (BRW), painted grey ware (PGW), classical Northern Black Polished ware (NBPW) and Medieval glazed ware (MGW). A large number of terracotta male and female figurines, plaques, sculptural pieces, corroded coins, burnt bricks, fragmentary inscription on stones, statues, ruined brick stupas etc. have been found all over the study area. These evidences shed light on the sway of different dynasties from prehistoric period to ancient and to the medieval period. The antiquities recovered from the district are well preserved in various museums under the supervision of Survey of India.
Written records include Ain-i-Akbar by Abul Fazal, Miscellaneous papers of revenue settlement, Institute Gazette, District Gazetteer, Gazetteers of the North West Provinces of Agra, Memoirs North western provinces of India, Statistical Abstract Rajasthan, Descriptive and Historical Account Rajasthan, a large number of books on regional and local history. These are preserved in the state archives, revenue records rooms of the district headquarters and libraries.

Culture, cults, folklore, legends and oral history as narrated by the local people, interview and field surveys have been used to trace the place-names of villages and genealogy of the various clans.

To examine the spatial distribution and types of settlement in terms of spacing, degree of dispersion and concentration, quantitative techniques have been used in the following manner.

\[(i) \quad D = 1.0746 \sqrt{\frac{A}{N}}\]

\[(ii) \quad R_n = \frac{r_0}{r_e}\]

The changing patterns of the landscape / land occupied by different socio-cultural groups are carefully examined in sequential manner. The transformation and obliteration of the cultural
landscape have been tested within the conceptual frame of histogenesis and morphogenesis.

The spatial diffusion of the clan settlements shows a typical character in which the third stage shows a asymptotic growth of settlement, thus it is similar to By Lund. The coastal like diffusion model is found because of its location.

The dimensional attributes have been applied to test the diffusion stage of the clan settlement and thus the ratio of the settlement velocity, viscosity of the landscape and the energy of the pioneering population have been considered. On the basis of these attributes, generalized models have been presented which may also be comparable to other areas.

For the analysis of the pattern or shape of settlement both qualitative (classical), and quantitative (modern) approaches have been applied. Shapes of settlements have been measured taking ninety villages as a sample on random basis, using the following formula:

\[ S = \frac{A}{\pi R^2} \]

The shape analysis of settlement has also been made by taken into account the number of contacts between a village and its neighbouring villages. Dirichlet / Thiessen Polygons and Hexagon have been used for proper planning of rural settlements.
The composition of building construction and material has been taken into consideration for the classification of rural houses. Social morphology or spatial patterning of built-up area of selected village of discrete ecological settings at micro level has been analyzed on the basis of religio-ritual and secular dominance models.

The study is primarily based on field work and analysis of topographical sheets as well as orally recorded history. Field work has involved extensive traversing through the study area with the aim of observing the landscape features of the study area. Observation of the landscape includes a careful examination of the village landscape, its settlement morphology, social morphology, house types, building material used, ground plans, models of house construction, and general living conditions of the people. Such detailed work on the core elements of rural settlement has, however been limited to three selected villages.

The collected data, both primary and secondary has been presented in the tabular form and analyzed, using different quantitative techniques to derive specific conclusions regarding dispersion, spacing and settlement type. Simple choropleth mapping has been adopted throughout the work. Panchayat Samiti/Tehsils have been chosen areal units for the analysis of rural settlements.
Organization of Chapters

The entire study is divided into seven chapters excluding introduction and conclusion.

The introduction deals with the meaning, scopes, various approaches of the rural settlements, a review of relevant literature and references, importance of study, selection of the area, objective, methodology and the organization of the chapters.

The First Chapter gives the brief introduction of the area, its physical, cultural and demographic setting with emphasis on physiographic, geology, drainage, climate, soil and cultural attributes i.e., land use, cropping pattern, irrigation, transport and communication, manufacturing activities. It also provide demographic structure in the district.

The Second Chapter deals with historical perspective concerning the evolution of settlements of different period taking into account the evolution of settlements in sequent occupancy, the place names analysis, territorial evolution of clan settlement and diffusion of settlements.

The Third Chapter deals with spatio-temporal analysis of various clan settlements of the study area. The dimensional attributed have been applied to test the diffusion stages of clan settlements. Thus, notion of the settlements velocity, viscosity of the landscape and the energy of pioneering population have been
considered. On the basis of these attributes, generalized models have been presented which may also be comparable to other areas.

In the Fourth Chapter an attempt has been made to study the spatial distribution of rural settlements. The distribution of rural settlements is affected by several factors in which relief, distribution of resources, population, land under cultivation, types of agriculture development of road network, localization of resources, political decision and cultural bonds are the important factors on the distribution of rural settlements in the Bharatpur District. The spatial pattern of rural settlements has been studied quantitatively by using quantitative techniques.

The Chapter Fifth examines the various pattern of rural settlement found in the study area in response to the physical and cultural factors. These patterns have been identified on the basis of Survey of Indian Topographical Sheet and have been checked and modified with the help of village cadastral maps and through personal observation, wherever possible. Shape analysis of the villages has been based on quantitative technique taking into account ninety village sample on random basis. Further, relationship among contact index, population density and areal size of the villages have been studied. The present researcher has recommended that the Thiessan Polygon and Hexagon be adopted as model while planning the development of the villages in the study area.
The Sixth Chapter has been devoted to study the rural house types and building material. The Indian villages bounded by agricultural land with different types of building materials and house types in regional settings. Human dwellings are governed by tradition and cultural elements of the time and they form one of the most basic elements in cultural landscape and hold a significant place in the geographical analysis of settlement. House is a symbol regionalism representing social, cultural and economic organization of its people. It also assesses the impact of various physical and cultural factors on the pattern of house and the type of the building material used in the study area. Suitable rural house plan and a few remedial measures have been suggested for improving the village environment.

The Chapter Seventh seeks to analyse the social morphology of three selected villages (built-up areas), based on the religio-ritual and secular dominance models. The influence of caste and dominant landownership on spatial patterning of rural houses of these three selected villages of the district have been examined through field observation.

Lastly the conclusions have been drawn and recommendation have been made for the rational planning of rural habitat in the study area.
CHAPTER 1

GENERAL PHYSICAL, CULTURAL
AND DEMOGRAPHIC SETTING

1. PHYSICAL SETTING
2. CULTURAL SETTING
3. DEMOGRAPHIC STRUCTURE
Before assessing the characteristics of the rural landscape, it is essential to have an overview of its ecological and cultural attributes, which shape the geographical identity of a region. This is a prerequisite for the analysis of human settlement in spatio temporal context. With the assumption that the environment affects the nature of human habitat, some of the important physical and cultural features of the Bharatpur discussed in the following paragraph.

Bharatpur District is a eastern most district of Rajasthan, which is at a distance of about 180 km from Jaipur, about 160 km from Delhi and 55 km from Agra. It forms the boundary with Gurgaon district in north, with Mathura and Agra district in the east, Morena district of Madhya Pradesh in the south and Sawai Madhopur and Alwar district of Rajasthan in the West (Fig. 1.1). The District lies in between 26°22' to 27°50' north latitude and 76°33' to 78°17' east longitudes. The district according to 1991 census has a population of 1,651,584. The population of the district is predominantly rural in character as 80.58% of people live in 1345 inhabited villages while 19.42% of the population live in the ten urban centre. The average density of population in the district is 326 persons per sq. km. The district is divided into 9 panchayat Samiti viz. Kaman, Nagar Pahari, Deeg, Kumher, Sewar, Nabdai, Weir, Bayana and Rupbas (Fig. 1.2). It is also divided into ten tehsils viz. Kaman, Pahari, Nagar, Deeg, Kumher, Bharatpur, Nabdai, Weir, Rupbas and Bayana (Fig. 1.3).
DISTRICT BHARATPUR
ADMINISTRATIVE DIVISIONS
(PANCHAYAT SAMITI)
1. Physical Setting

Bharatpur District manifests many geological characters. Generally the northern portion of the district is covered with alluvium giving rise to many isolated hill of schist and quartzite belonging to the Aravali and Delhi system respectively. The quartzized are well exposed in Bayana tehsil. To the south east of the district sandstone of upper Vindhayan Age is faulted down against the quartzizites and form a horizontal plateau over looking the alluvium of the chambal river.

Formation of Bharatpur district is almost entirely of sedimentary rocks. There are no granite rock, except metamorphic or volcanic one. The igneous rocks occurring only in small proportion. The exposed rocks may be divided into three class, namely

(i) Alluvial

(ii) The series called Vindhyan and

(iii) The series called Alwar quartzites

The district forms parts of the alluvial basin of the Ganga and Yamuna. Consequently, great majority of the exposed rocks are alluvial, consist of modern alluvial deposits with blown sends of Rajasthan desert with occasionally forms into mounds on the leeward side of Dholpur and Rajakhera Tehsil are covered by the alluvium of the Chambal River.

Vindhyan occurs in the range which runs from Fatehpur Sikri towards Hindaun. The range belongs to the upper Vindhyan division,
and two of its sub-division, the Bhandar and Rewa are represented, the former extensively the main range representing upper Bhandar, consist almost entirely of sandstone of various texture and colour, varying from the very fine rock to almost conglomerates. The prevailing colour is brick red white spots or streak, sometimes green and yellowish white, occurring sometimes in alternative beds of considerable thickness. The ridge which runs parallel to the west of the above range in tehsil Rupbas is probably formed of Rewa. This appears likely both from the character of stone and dip of the strata, the general characteristics of the Rewa's being coarse greyish, white, while those of Bhandar are fine red, speckled and streak with white. In some places there differences are well marked, in other they merge into each other. The ridge consists of sandstone in massive strata and false bedded flags, usually hard and compact, occasionally verified, reddish and yellowish in colour. In some places, thick shally beds, mostly quartz of silex but sometimes clay are found. All the hills in the north and west are of the same character with limestone, horn stones, transition slate, silicious beds, schist and ferruginous conglomerates. However 21 km west of Bayana, near the village Nilhara are two small hills of popular breccia, though differing lithographically, they probably represent the Kaimur Conglomerate and are interesting as being the only probably representation of Kaimur in Bharatpur.

The rocky and rugged region of Bharatpur District is occupied by Vindhyan sandstone hill in the north-west part while in the
western part quartzite hills continue to a length of about 64 km. in
north east direction and thus from the hilly region of Dholpur unit.
They enter the district at Bhichoran, and towards the north east
Chahpur, Kemghatia, Ghughas, Shergarh and Bund Baretha hills are
prominent. These include the typical sandstone formation of the
Vindhayan system. The hills in the western side of the district
represent the geological formation of the Delhi system.

Thus the only geological formation exposed in this area are
Delhi and Vindhayans which are separated by the tapering out crop of
the alluvium near Bayana. Delhi is from the oldest formation in this
area. There are two separate two stages of Bayana and Weir as far as
the rock types (Pasceo) are concerned. The general sequence of Delhi
system is quartzite, shale and trap. This rock type continues from
Bayana onwards to Weir tehsil and further onwards to Bharatpur.

Physiographically the Bharatpur District consists of alluvial
Plain, fairly well wooded and cultivated with detached hills in north,
hilly and broken territory called the dang in south and low narrow
ranges parts of the western and north east frontier. A range of
sandstone hills run from Dholpur city in south-westerly direction
attaining at one place an altitude of 356.91 mts. above sea level.
These hills as well as those further to the west are mostly base of
vegetation. The land in Bharatpur, Bayana and Deeg sub-division of
the district is generally fertile and usually flat.
Hills and broken ground characterise almost the whole territory, which lies within a tract locally known as dang, a name given to region immediately above the narrow valley of the Chambal. The principal hills are on the northern border where several ranges run along a parallel to the boundary line, forming somewhat formidable barrier. Along the valley of Chambal an irregular and lofty wall of rock separates the land on the river from the upland which form the southern part of the district. From the summits of the posses, the view is often picturesque the rock standing out in striking contrast to comparatively rich and undulating plain. Below Bhairon and Utgir 476 and 451 mts respectively above sea level, the alluvial deposits become deeper, level ground become more frequent and hill standout more markedly, while in the neighborhood of Bharatpur town, the low ground is cut into Labyrinth of ravines.

In Bharatpur sub-division there is only one hill, named Mandholi, which lies on the east of Bharatpur city. Its highest peak is 216.10 mts above the sea level. There are some ranges of the Aravali hills extending over a length of about 274 mts with maximum height of 30 mts known as Pooth-Dhanwara and Daunga ki Mori.

In Bayana sub-division there is a big hill called Damdam, which start from the village Kachariapara and extend up Jarkho and other villages. There are few minor hill-rock which extend from Baretha to Samari. The length of the hill is 29 km. the height is 370.32 mts.
above sea level. These hills are marked except for small thorny bushes which grow generally during the rains.

1.1 Drainage

Water is a prime necessity of human being next to air. The existence of water bodies has played a very important role throughout human history, in the birth of many great civilization of the world, including, that of India. Water had been the centre of attraction and people have been settled along banks of small tributaries of rivers, avoiding big rivers because of the fear of flood which recurred frequently in them. Due to increasing pressure of population they settled along the banks of big rivers also.

In Bharatpur district there is no perennial river. The important rivers flowing through the district are Banganga the Gambhir, the Kakund, the Ruparel and Parvati. These rivers flow only during rains and dry up entirely two or three months after the latter have ceased. In (Fig. 1.4) the drainage system has been shown.

The Banganga River:

This rivers enters the district on the western border of Weir tehsil and follows due east towards Agra district, It spills freely over its northern banks as it passes through the district and about mid way in its course eastwards, the river has left it old channel and now flows in a northerly direction towards Uchchain, along the Bayana Uchchain road. The diversion of river has been induced artificially by
BHARATPUR DISTRICT
DRAINAGE

Fig. 1.4
the building of Bayana Uchchain road. This roads has a raised embankment from, Nakpur to Sewar, with flood regulates discharging in a easterly direction. The flood waste so discharged is again impound and distributed by other work the largest which is the Ajan Bund a fine embankment extending for 19 km across the direction of flow. It feeds many important for irrigation, the most well known of which are the Uchhain and Pathena canal, which eventually fill Ajan Bund in Bharatpur Tehsil. The supply of drinking water in Bharatpur depends on the river because the most which keeps the water in the wells sweet is filled up from the water of Anjan Bund, It has more than 2589.9 sq. km. of drainage area in Jaipur district and flows between low banks over which it spills when it floods. The important villages situated on its bank are, Kamalpur Bachhren, Chonker wala Kalan, Kherli Gujjar, Dharsoni, Shahpur and Barkhera.

**The Gambhir River**

This rivers also enters district from the south western corner, After retrieving the waters of Kakund, about 13 km higher and after traversing above 56 km. First towards the east and then in a north-easterly direction, it is joined with Banganga near the village Kurka of tehsil Rupbas. It usually ceases to flow about two months after the rainy season. It is not so useful for irrigation as Banganga is, but all the Nehri village, in the Bayana tehsil depend for their fertility on its water. A part of it comes into Pichuna canal and then it enters the old Banganga river bed. The silt of this stream is highly fertile, and crops
are commonly grown in the river bed after the rainy season. The river is made to spill largely into the Rupbas tehsil at eastern extremity of the district by means of natural and artificial Channel a Dhana Ghatai Bakholi and Shekhpur, all leading off from the southern bank. There is also a considerable natural spill from northern bank. This irrigation is valuable, the crop grown in the flooded land being remarkably good.

**The Kakund River:**

It is a smaller river entering the S-W border of the Bayana tehsil from the Karauli side. It was formerly an affluent of the Gambhir but it has become famous with construction of Baretha Bund, where its water are held up and from where they are released to irrigate land further north in Bayana and Rupbas tehsil. In fact this is only work of irrigation which except is years of very scanty rainfall can be considered a source of perennial irrigation. Its course for several kilometre is over an elevated plateau from which it descends by a series of falls near the village Gurha Dang, and it one of the falls called Dir the water is very deep and never dries up. The village situated on its banks are Chainpura and Baretha.

**The Ruparel River:**

This rises from the Thana Ghazi hills in the Alwar district and entering this district near Gopalgarh, is held up by Sikri Bund, a fine embankment extending for about 19 km along the western boundary which curves round in a southerly direction, from where its water are
distributed to Pahari tehsil and Nagar tehsil in the proportion of 5:8. The bund is largely enough to discharge 443 cubic metres of water in heavy floods. It is not design to store water, but merely to hold it up for distribution, according to the requirements of agriculture, to the main courses to which, through these outlets, the water is led, one flows to the north east toward Gopalgarh, Pahari and Kaman and the others, to south east towards Deeg, Kumher and Bharatpur. The effectual Irrigation of land in these areas to some extent, depends on this river, but so much water is utilized on the way that except in years of very heavy floods. It never posses to the opposite border of district to enter Mathura and Agra district. It had more than 2590 sq km of drainage area in the erstwhile Alwar State. It flows between low banks over which it spills when in flood and thus affords great facility for irrigation.

The Parvati River:

This is a seasonal river, it rises in Karauli close to the western border and, after a north-easterly course of about 96.5 km falls into the Banganga. It has two small tributaries Mendka and Mendki.

Lakes:

There are four lakes in the Bharatpur district namely Moti Jheel, situated about three km west of Bharatpur city used for irrigation purposes, Keola Deo Jheel situated about 5 km south east of Bharatpur city and famous for its duck shoot. Madal Jheel, situated on the northern border and filled by the Ruparel river and
used for irrigation purpose and lastly, Jheel Ka Bara, situated about
14 km north of Bayana town under the hill.

1.2 Climate

The climate of the district fluctuates between the two extreme of
severe cold in winter and oppressive heat in summer. Rainfall in the
district is scanty ranging from 40 to 80 cm per annum. The rainfall
during the south west Monsoon season contribute about 80% of the
annual rainfall.

The district has a dry climate with hot summer, a cold winter
and short monsoon season. The cold season starts by about the
middle of November and continues to about the beginning of March.
The hot season follows thereafter and extends to the end of June. The
south west monsoon season is from July to Mid September. The
period from mid September to mid November may be termed as the
post monsoon.

The period from March to June is one of continuous increase in
temperature, May and June being the hottest month of the year. In
summer season the heat is intense and scorching dust laden winds
adds to the discomfort. The Maximum temperature sometimes reach
47°C and above in this season. The setting in south west monsoon by
about the June lowers the temperature appreciably but the relief from
the heat is not marked due to the increase dawpness of monsoon air.
After the withdrawal of monsoon by mid September, days become a
little hotter, but might become progressively cooler. From November
both days and night temperature decreases rapidly till January, the coldest month. In association of cold wave which effect the district in the wake of western disturbances passing across north India during the cold season, minimum temperature may at times fall near about the freezing point of water. During the Southwest Monsoon season the relative humidity are generally over 70%.

1.3 Soil

The soils in the district are sandy, sandy loam, clay, clay loam, and loam. Roughly speaking about half of the total soil is sandy loam, found mostly in the southwest, and about one third is clay loam lying in north east and one sixth loam, An the central region. The soil retains moisture for a long period and is capable of producing a variety of crops. The soils classification with regard to quality is known locally as follows: Chiknot, a stiffis clay or clay loam, black in colour, the richest natural soil, rarely manured, Matiyar the ordinary loam, which has a mixture of sand and is lighter in colour and more easily worked than Chiknot, it is the common soil of the plains and is much improved by manure, and bhur, the inferior sandy soil found at the foot of hills, on high upland and along the bank of streams which is most common in Weir and Bayana and is suited only for the lighter crops. In the north and north-west of what formerly used Dholpur state is found a mixture of sand clay known as domat, which is productivity as best land in the adjoining part of Uttar pradesh. In
ravines of Chambals, there is alluvial Mud (Kachhar) on which crops are raised.

The settlement classification of soil follows mainly the means of irrigation. But other factors like depth of soil and the situation of a field are also taken into consideration. There are sub-divisions in each class according to quality. The main classification is Chahi (irrigated) and barani (un-irrigated).

1. Chahi: This land is irrigated by wells, tanks or canals. This land is further sub-divided as follows:

(a) Chahi Gorwan: This type of land produces exceptionally good crops in both the harvest in a year and is situated in the neighborhood of habitation and has the benefit of a village manures.

(b) Chahi A: The fertile and richly manured areas with sweet water wells often adjacent to the principal or subsidiary villages, with regular irrigation. Over about 50% of its area, crops are grown twice annually.

(c) Chahi I: Lands with good standard wells and regular irrigation and with occasional or restricted double cropping.

(d) Chahi II: It consists of areas having wells with inferior quality or quantity of water. There areas are mostly single-cropped, with irrigation varying from 50 to 60%.

(e) Chahi III: It consists of poor chahi with bhur (Sandy) lands, with irregular irrigation.
2. **Barani**: The barani or un-irrigated land is classified as follows:

   (a) **Barani A**: It consists of parat chahi areas and superior type of fields lying either in neighborhood of villages or intermixed with chahi or lands lying in depression.

   (b) **Barani I**: Good level fields of sandy soils with no special advantages and regular cultivated and bearing a good natural produce of pala and grass.

   (c) **Barani II**: Uneven or slopy fields either of sandy soils or occupying certain other disadvantages position.

   (d) **Barani III**: Uneven fields with excessive admixture of sand, areas under fluctuating cultivation or newly ploughed lands.

### 1.4 Flora

The forest of the district is dry deciduous. Consisting of *Anogeissus pendula* (Dhok or Dhao), *Acacia catechu* (Khair) etc.

The forests are largely confined to the southern portion of the district and stretched about 16 km wide, along the river Chambal, and Karauli sub-division of Sawai Madhopur district. The composition and quality of the forest varies depending on soil conditions. Generally speaking, the forest are open and of poor quality, except at places where the soil conditions are good.

The growth of principal trees in the forest is generally slow and the height poor. The district is entirely outside the range of the chief timber species viz teak and sal. On an average, the height of principal trees vary from 4.5 mts to 7.5 mtrs. in favorable localities the height reaching up to 12 mts. The diameter increment is slow and most of
the principal species after attaining a diameter of 30 cm at breast height, start to deteriorate. The different types of forest found in the district may be further classified as Dhok forest, Khair forest, Miscellaneous forest, Ravine scrub, Grasslands and Degraded forests.

**Dhok Forest**

This type of forest is economically the best and occur all over the district. The forest are generally irregular and situated at hills, usually on rocky or stony slopes or gently undulating grounds. Dhok (Anoeissus pendula) is the principal species growing in these forest and is fairly gregarious. The common associates of Dhok in these forests are, Acacia Catechu (Khair), Acacia leucophloea (Arunj), Buter Monosperma (Dhak), Zizphus mauritiana (Bar) Bauhiria racemosa (Kachnar), Holarrhena antidysentery (Kurchi). The under growth of these forest generally consist of Dichrostachys cinerea (Birbia), Grewia flarescane (Chapren), Grewra tenax (Ganyan), Flaconsitia ramouteha Kakon), Balanites aegyptiaca (Hingot) and Zizyphus mummularia (Jhanber).

**Khair Forest**:

These are fairly extensive forest lands, especially the plateaus in this district, which are covered with almost pure crops of Khair forest. The common associates of Khair are Ber, Arunj, Dhok, Kakali, Birbira, Chapren, Hingot, Jharber.
The Khair trees in these forests are generally stunted, poor and openly grown. The height is hardly 3.5 mts and diameter 15 cm at the base. The forest are largely unfit for Kattha manufacture.

**Miscellaneous Forests:**

These forest include Babul forests in the Ghana block near Bharatpur city and plantations along the river Chambal in the Dholpur range. The associate of Babul in Ghana forest are Kadam, Arunj, Kabulikikar, Chhotapilu or Jal, Hins, Karil or Kair, Hingot.

**Grasslands:**

This includes the Mandera Bir near Deeg, except for a small portion which grows trees like Arunj, Babul, Chhotapilu or jal, karil or kair, Hins, the Bir is almost a grassy blank. Among the grasses the important ones are Iseilema luxum, Eremopogon foyeolatus, Dichanthium annulatum, Heteropogan contrortus, Desmostachya bipinnata, Cenchrus species, chloris species, Aristida species, and Yetweria Zizanioids (Khas).

**Ravine Scrub:**

A large portion of land in the district occurring as a belt along the river Chambal is full of ravines. These ravines are either devoid of any vegetation or carry a very poor and open crop of species like Drosopis spicigera (Khejra Accacia leophloea (Arunj) Boswellia serrate (Salar), Salmalia malabarice (Semal), Salvadera persica (Jal) and Birbira.

**Degraded Forest and Blanks:**

These are fairly extensive areas in this district which, though
legally called forest areas, are either devoid of vegetation or have only a bushy type of forest growth. These areas had good forests in the past, but owing to various forms of misuse and degradation, have reached the present stage.

1.5 Fauna

The district is known for its duck shoots, geese, duck, teals, pintails, siberian cranes, peticans and other varieties of birds migrate to this area during winter. Local birds are mainly egrets, painted storks, darter, besides common parakeets, crows, babblers, partridges and weaver birds.

The carnivore found in the district consist mainly of tigers, panthers, hyaena, Jackal, fox and fengage cat, other animals found in the area are bear, spotted deer, black buck, chital, chinkaras, blue bull, four horned antelope, sarmbhare & hare.

Among reptiles there are common snakes, cobra, python, crocodiles are found in the Chambal river, Ramsagar and Baretha tank.

Under the Rajasthan Wild Animals and Birds Protection Act, 1951, a close period is prescribed for each species. In the open period shooting inside the forest area is regulated by permits issued by the Divisional Forest Officer, Bharatput. Besides the fee for permission, royalties for shot animals are also charged.

Game Sanctuaries

There are three game sanctuaries in this district.

(i) Keoladeo Ghana Bird Sanctuary.
(ii) Van Vihar

(iii) Ramsagar Sanctuary.

**Keoladeo Ghana Bird Sanctuary:**

It is situated near Bharatpur and extends over an area of 28.32 sq.km. The topography of the sanctuary is such that it is mostly low lying and becomes a lake during the rains. This lakes supports a great variety of duck weeds and fish, thus providing abundant food for the water birds. A very large number of sarus, cormorant, snake birds, egret, heron, stork etc, arrive in the monsoon for breeding. The numerous babul and other trees growing in the lake provide an excellent nesting place. The duck weed attracts thousand of migratory birds including the Siberian crane, making the area excellent for duck shooting. When water dries up in summer it develops into an excellent pasture and hundred of cheetal, black buck, sambhar nilgai etc. come for grazing. The moist soil provides an excellent feeding ground for wild boar.

**Van Vihar Sanctuary**

The Van Vihar Sanctuary is situated about 18 km from Dholpur and extend over 36.6 sq.km. Cheetal, Sambhar, Chinkara, Nilqai, and wild boar are very common in this sanctuary. Tiger and bear are also occasionally found here. Panther is found commonly. The common birds found are tree pie, parakeet, chat, wagtail, shrike, babbler, and bulbul. Among game birds, partridge grey and black, bush quail, and red spur fowls are common. A number of migratory water birds inhabit the tanks in the sanctuaries.
**Ram Sagar Sanctuary:**

Area 23.2 sq. km, an extension of Van Vihar, is only 18 km from it. The general topography, vegetation and wild life found here are almost the same as in Van Vihar. The Ram Sagar lake has variety of fish and crocodiles are also found here.

2. **Cultural Setting**

In seeking his livelihood, man is influenced by physical environment but also by the culture to which he belongs\(^1\) Physical feature of an area, condition the nature of its agrarian economy. However, at micro level there are variations which lead to different distributional patterns of cultural landscape. Because of fertile soil, level topography and more or less favorable climatic condition, agriculture has attained overwhelming importance in the economy of Bharatpur district. Hence an attempt has been made to discuss the characteristics along with distributional pattern of cultural landscape of the district viz, land use, cropping, transport and communication. This analysis of the elements of the cultural landscape will help in comprehending population and settlement pattern in study area.

2.1 **Land Use**

The total area for land utilization purposes of the district is 507,448 hectares, whereas the total geographical area of the district is

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BHARATPUR DISTRICT
LAND USE
1988-89

Net Sown Area
Barren And Cultivated Land
Land Put To Non Agriculture Use
Forest
Other Uncultivated Land Including Fellowland And Culturable Waste

Fig. 1.5

67
BHARATPUR DISTRICT
CROPPING PATTERN
1988-89

Fig. 1.6
810,010 hectares. The figure 1.5 shows the land use pattern of the district.

2.2 Cropping Pattern:

There are three harvesting seasons in Bharatpur district namely Rabi, Kharif and Zaid. During rabi season, wheat, barley, arhar, gram, peas and mustard are the chief crops sown in the district, while during the Kharif season bajra, maize are principal crops. During zaid harvest, same fodder crops and vegetables are grown in the district. The figure (1.6) shows the cropping pattern of the district.

2.3 Transport and Communication:

Roads are of immense significance in modern times in the process of the development in any area. The total length of roads is 1342 km and two national highways i.e. No.11 and No.2 pass through the district. The district is also having railway junction for both the metre and broad gauge. There are 7 stations under metre gauge and one station of broad gauge. The figure 1.7 shows the transportation of the district.

2.4 Industries

The district is not rich as far as industries are concerned. There are three large scale industries in the district viz. The central India Machinery Manufacturing Co. (CIMCO) Ltd., General Engineering industries and Dalmia Dairy Industry Bharatpur. Enquiries reveal that Nagar was known for its earthen works and clay pipes. Salt was
BHARATPUR DISTRICT
TRANSPORT SYSTEM

Fig. 1.7
manufactured in large quantities out of the brine drawn from saline wells in almost all the towns and important villages. Bayana was one of the main centre for indigo production.

The industrial area at Bharatpur, Deeg and Bayana were set up in district by the Rajasthan State Industrial Development and Investment Corporation Ltd. in the year 1972, 1978 and 1980 respectively.

3. Demographic Structure

Population is one of the dominant factors determining the nature of human settlements in terms of size and economy. The lay out of the settlement, and their vertical and horizontal growth are the direct outcome of the size of population its pressure and density. A study of interrelationship between man and his settlement shows various trends and features of social interaction, socio-spatial and physio-cultural structure of the region, which together constitute its morphogenetic structure. Therefore an attempt is made here to discuss the demographic characteristic of the study area.

3.1 Distribution and Growth of Population

The distribution of population is determined by the physical and cultural factors, as it has been stated that both the factors are not uniformity distributed, therefore it is obvious that population distribution must not be uniform. The study reveals that the pattern of the distribution at Tehsil and Samiti level is very uneven. The
temporal analysis also reveals the growth of population is also not uniform. According to 1991 census the total population of the district is 1,651,584. The district is dominant in rural population containing 80.58% of the total population living in 1345 villages, whereas rest of population live in urban areas. Thus the rural and urban population ratio is very alarming.

TABLE 1.1
Population growth (1901-91)

<table>
<thead>
<tr>
<th>Census year</th>
<th>Population</th>
<th>Percentage decadal variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>598,112</td>
<td>-</td>
</tr>
<tr>
<td>1911</td>
<td>547,577</td>
<td>-8.45</td>
</tr>
<tr>
<td>1921</td>
<td>483,840</td>
<td>-1164</td>
</tr>
<tr>
<td>1931</td>
<td>494,162</td>
<td>+2.13</td>
</tr>
<tr>
<td>1941</td>
<td>579,553</td>
<td>+16.27</td>
</tr>
<tr>
<td>1951</td>
<td>605,276</td>
<td>+5.35</td>
</tr>
<tr>
<td>1961</td>
<td>786,156</td>
<td>+29.88</td>
</tr>
<tr>
<td>1971</td>
<td>1030,551</td>
<td>+31.09</td>
</tr>
<tr>
<td>1981</td>
<td>1299,073</td>
<td>+26.06</td>
</tr>
<tr>
<td>1991</td>
<td>1651,584</td>
<td>+27.14</td>
</tr>
</tbody>
</table>


The highest proportion of rural population 13.65 percent reside in Nagar Pahari Panchayat Samiti followed by 12.52 percent in Rupbas Panchayat Samiti. In urban areas of district, Bharatpur town ranks at top with 48.90 percent share in the total urban population of
the district while Deeg and Bayana towns rank next only 10.62 and 8.27 percent respectively.

The population of the district has increased steadily over the twenty years having risen from 1030 lakh in 1970 to 16.51 lakh in 1991. There has been a steady increase in the growth rate of 31.09 percent recorded during 1961-71. The trend of increase of population is successive decades has been given in Table 1.1 and curve has been shown in Fig. 1.8.

In fact the population of district registered an increase from 1921 onwards upto 1991, as the population of the district registered Negative growth rates during the decades 1901-11 and 1911-21 of 8.45 percent and 11.64 percent respectively. The growth rate of 27.14 percent reported in district during the decade 1981-91 is lower than the state growth rate of 28.44 percent.

3.2 Density of Population

The average density of population of the district is 326 persons per sq. km. In rural areas the density of population is 270 person per sq.km. Whereas in urban areas 2457 person per sq.km. In Urban areas Deeg is highly density populated. The density of population in Deeg town is 14,142 persons per sq.km. while it is only 640 and 677 in Sewar Kalan town and Bhusawar town respectively.

3.3 Sex Ratio

There are 832 female per thousand male in the district. The sex ratio in rural areas is 826 whereas in urban areas it is 857. There has
BHARATPUR DISTRICT
POPULATION GROWTH
1901–91

Fig. 1.8

74
been a sharp fluctuation in the sex ratio in the district over the
decade since 1901. The population of females in the district has
always been on the lower side as compare to males. In 1991 the
proportion of females to total male population is highest in Kaman
Panchayat Samiti, the sex ratio being 864 as compared to some other
Panchayat Samiti namely Nagar Pahari, Kumher, Weir, Sewar where
the sex ratio being 849, 828, 824 and 823 respectively. The lowest sex
ratio i.e. 787 is in Bayana Panchayat Samit. In urban areas the
highest sex ratio is rendered in Bhusawar town i.e. 977.

3.4 Literary

As per 1991 census the percentage of literates in the district is
42.96. However there is still a mark differences in the literacy rates of
two sexes. Female literacy rate is falling behind male literacy rate in
all parts of the district i.e. both in rural and urban areas.

At the panchayat samiti level the literacy rate for the total rural
areas varies from 45.21% in Kumher to 24.27% in Kaman. However in
case of urban areas the literacy rate for Bharatpur city and Bayana
town are 67.30 and 66.07 percent respectively. Amongst male in rural
areas the percentage of literacy varies from 68.60% in Kumher to
39.80% in Kaman panchayat Samiti. In urban areas for males on the
other hand, Bayana town has registered maximum literacy rate of
81.05 percent and Kumher town the lowest rate of 71.91%. However,
a rather different position is observed in case of females in rural and
urban areas. It is much higher in urban areas. The lowest 6.06% is
observed in Kaman panchayat samiti. In urban areas, on the other hand, females have attained higher literacy rate with maximum of 53.51% in Bharatpur city followed by Bayana town 48.40%. In over all literacy rate recorded for the district comes out to 63.37% for urban areas while it is 37.84% in total rural areas of the district.
CHAPTER II

EVOLUTION OF SETTLEMENTS

1. EVOLUTION OF SETTLEMENTS IN SEQUENT OCCUPANCY
   1.1 Prehistoric Period
   1.2 Ancient Period
   1.3 Medieval Period
   1.4 Modern Period

2. PLACE NAME ANALYSIS

3. TERRITORIAL EVOLUTION OF CLAN SETTLEMENTS

4. DIFFUSION OF SETTLEMENTS
The interplay of historical and socio-economic factors with physico-cultural determinant has produced a social structure of Bharatpur District, which is quite distinct from that of other region. The intermixing of various ethnic groups and cultural traits from within and outside the country have produced a complex pattern. The beginnings of settlements in the region go back to prehistoric period. This is borne out by the legends and folk lore of the area, the presence of large number of mounds suggest that the area had a number of settlements in ancient period. Archaeological excavations have shown that settlements of this region date back to 1500 B.C. and area has been under the sway of many dynasties. Thus the present pattern of settlements distribution is the result of a series of ups and downs of earlier settlements. This is why the study of its historical evolution is most relevant to present work.

Hence an attempt has been made here to trace the evolution of settlements of this district taking into account the evolution of settlements in sequent occupancy, place-names, territorial evolution of clan settlements and diffusion of settlements.

1. EVOLUTION OF SETTLEMENTS IN SEQUENT OCCUPANCY

On account of the non-availability of concern literature, the history of human occupance of the study area is shrouded in obscurity. Any analysis of the cultural tradition made previously indicate the region has been the one of the most ancient settled
place in the country. Some literature and historical account on the settlement in this region in general are available. Hence for the present study, the literary historical account and archaeological evidence found in Bharatpur District have been taken into consideration. The evolution of various settlement in sequent occupancy has been studied under following heads:

1.1 Prehistoric
1.2 Ancient Period
1.3 Medieval Period
1.4 Modern Period

1.1 Prehistoric

Long before the arrival of Aryans the region had settlement of the aboriginals. The earliest remains i.e., terracotta cakes, steatite and faience beads, Kiln-burn-bricks, a furnaces, animals figurines, inscribed pots, a broken blade of bronze or copper have been found at Pengore and Sewar. These antiquities are believed to have belong to the Harappan phase of Indus valley culture and point to the sites having being a station of that culture in region¹.

1.2 Ancient Period

Excavation of various sites of the region have been shown that settlement of this region begin around 1500 B.C. The earliest remains i.e. pieces of ochre coloured pottery (OCP 1800-1300 B.C.) have been found at Kair, Khan Kheri, Nithar Air, Pengore and

The Black and Red Wares (BRW 1300-1200 B.C.) have been recovered from Dehra, Umra, Kwardiya, Satar, Darapur. The region is also very rich in the deposit of painted grey ware and its associated ware. A large number of fragments and even complete pots of the classical and cruddy painted grey ware (P.G.W. 1300-1700 B.C.) have been recovered from the different sites of the district, such as Kaman, Januthai Kushana, Pengore, Sewar, Darr, Abar, Gamri, Therya, Viravi, Shimnagar, Songaon, Jatohithem, Gulena, Gohanwali, Agona, Pai, Sahera, Ikram, Karewa, Satar, Tomrer, Umra, Promodia, Khoh.

Recent excavations at Noh revealed that existence of five culture period of ceramic industry viz. Period I Ochre coloured ware period, Period II: Black and Red ware Period III: Painted Grey ware, period IV: North Black polish ware and Period V: Sunga Kushan phase. Period I represented by a 45-70 cm thick deposit by yellowish brown earth, mixed with kankar, showed the use of ochre coloured pottery. The OCP sherds from Noh, orange to deep red coloured, are wheel turned. Most of them showed rolled edges. Apart from the fragments a basin and a carinated bowl, no complete shape

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1. *Indian Archaeology*, 1877-78, p.46.

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BHARATPUR DISTRICT
SETTLEMENT SITE OF
DIFFERENT PERIODS

Ochrcolour
pottery (OCP)
(1800-1300BC)

Early Historlculture
(200 BC-300 AD)

Medieval ware (MW)

State Boundary
District Boundary

Fig.2.1
were available. The collection also included two shreds into incised linear decoration.

Period II was marked by the use of plain black and red ware which forms a distinct phase between the deposit yielding the OCP and PGW. The black and the red ware at Noh, represented mostly by dish and bowl and showed incised decoration which were noticed for the first time. The associated ceramic of this period were coarse red and black shipped wares. The distinct features of this period however was the presence of shapeless iron piece. The other findings includes ghata (vase shaped) bead and bone spike. No structural remains were noticed in the area under excavation.

Period III was marked by the distributed strata. However, sufficient quantities of PG and NBP wares was also presence, though in less quantity. The others finding from the period included, beads and semi precious stone, copper, bone and terracotta, terracotta disc (incised a scalloped), terracotta wheel and gamesman, bone socket, spikes and decorated figurines, objects of iron like dishes, arrow heads, spear heads etc. hammer stone erucibles and a PG ware sherd having cloth impression.

Period IV witness the total disappearance of black and red ware. The PG ware in basic fabric, however, continued, along with the ware. The other findings from the period included, beads of
Plate 2.1  Standing Human figure, Mauryan Period

Plate 2.2  Ek-Muhi Siva Lingam, Sunga Period
terracotta glass wory and stove, a stealite casket, correced copper coins and terracotta human and animal figurines.

Period V was characterized by the typical pottery of Sunga and Kushan periods. The period is marked by eight structural phase. The exact plan of the houses, of course, could not be determined due to limited nature of the area under excavation. The use of both sun dried and backed bricks were attested. Three earthen hearthies in a single row as also a rock well with sixteen terracotta ring were also expored. Sherd decorated with 'triratna' and 'Svatika' symbols were also obtained. Noteworthy finds of the period comprised copper coins, dices, antimony rods, bangles and shell, glass and terracotta potters dabber, stone beads etc and number of terracotta figurines, both human and animal on terracotta humped bull showed the trident symbol over it (Plates no. 2.2, 2.3, 2.4).

Exploration at Rupbas, Sewar, Bagadan, Aghapur, Aou and Kaman in the district showed that the last three placed were painted grey site. In the course of exposing the plinth of the monument called Chaurasi Khamba at Kaman, a few sculpture and ornate architecture fragments including a stone inscription of circa ninth century A.D. were also discovered. Other findings

1. Indian Archaeology, A Review, Department of Archaeology Govt. of India, New Delhi, p.74.
3. Indian Archaeology, A Review, (1957-58)Department of Archaeology Govt. of India, New Delhi, p.69.
Plate 2.3  Dwarfish Figure (Kumbha Rashi) Sunga Period

Plate 2.4  Bodhi Sattva, Kushan Period
include the Gupta sculpture from Pangore (near Deeg) and a number of early medieval stone relief and sculpture of the Abaneri group from Nithar near Ballabhgarh. In Dholpur region, near Abdulpur, exploration brought to light an extensive ancient site, strewn with brickbats, Jain and Savite sculptures and potsherds including those of painted grey ware and black and red ware. Locally known as Dhonder Khera, the site is situated on the confluence of two rivulets-Medki and Maghi, both tributaries of river Paravati (Plates no. 2.5, 2.6).

Though it is not possible to trace the successive evolution of settlements in the early historical periods, it is almost certain that the region was occupied by Pre-Aryan people during prehistoric times. Though archaeological evidences of earliest settlement of the Aryan people in area are not available, it may be summarized that their society was mainly rural, based on agriculture economy. They must have cleared the vegetation along tributaries of the Parvati, Chambal and Ghambhir rivers to settle in this region. They must have made their colonies and named these after the name of the chief of their tribes, or clans. By the end of seventh century B.C. the Aryanization of the area had been completed and a four tier political organization had been evolved i.e. tribal Kingdom (rastia), containing tribes (Jana), tribal units (Vish) and villages (grana).¹ The smallest unit of a settlement was the griha (house) followed by

Plate 2.5  Vishnu Halaina, 12th Century A.D.

Plate 2.6  Parikar, Brahmbad, 17th Century A.D.
kula (habitation of joint family) which was headed by the eldest male member of the family called Kulapa villages were the basic units of administration\(^1\) and were generally of three types: the majority of them were those which had grown out of inter mixing of the Aryan and non Aryan settler whose main occupation was agriculture. The habitat (Vastu), around the village deity was surrounded by gram-Kshetra (cultivated field) beyond which lay Vraja (forest and pasture lands). The second type was the paccanta grama (border village) inhabited by aboriginal a degraded tribes. The type of consisted of villages mostly occupied by artisans and craftsman.\(^2\) The houses of the period were made of wood and bamboo and they did not differ much from those found today.\(^3\)

The settlement of the Aryan may be classified on the basis of their function into six different types, which are as follows by their:

(i) Goshchala (Cattle ranch)

(ii) Pali (a small barbarian settlement)

(iii) Durga (Fort)

(iv) Kharrata or Patkan (town)

(v) Nagar (City)

The head or the protector of an Aryan villages was known as

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There were a joint family system in these villages, and its organization was based on decimal system. Aryan settlement systems were divided into eight types, on the basis of their layout and plan, which are as follows:

(i) Dandaka (resembling staff)
(ii) Sarvatobhadra (happy in all respect)
(iii) Nandyavarta (abode of happiness)
(iv) Padmaka (like lotus flower)
(v) Prastava (conch-shaped)
(vi) Karmuka (bow-shaped)
(vii) Chatarmukha (having four faces or walls)

Figure 2.2 shows the plan and layout of Aryan villages. Each village was surrounded by a wall and a ditch for defense purpose. There was generally a gate in the middle of each of the four sides, dividing the village into four quarters. The centre of the village was generally occupied by a temple, tank or a public hall. The four quarters were further sub-divided by straight streets. Each quarter was inhabited by people of a particular caste or profession, the best quarters being generally reserved for Brahmans and people of other high caste.

PATTERN OF RURAL SETTLEMENT IN ANCIENT PERIOD

DANDAKA

SARVATOBHADRA

NANDYAVARTA

PADMAKA

SWASTIKA

KARMUKA

PRASTARA

CHATURMUKHA

--- DITCH --- TANK ---
--- CIRCUMAMBULATORY PASSAGE ---

Fig. 2.2
These early settlement were in the form of compact and self sufficient village, they were variously gamak (small village), gama (ordinary village), Thigoma gama (big village), gama (ordinary village) dwara gama (sub urban village) and pachhanta gama (urban village). Around the village there were arable lands (gramak-shetra), a common pasture land for the cattle and a jungle to provide timber and fuel-wood. There was a garmika (headman) in every village either nominated by the king or elected by gama Vriddhas (village elders) to manage the affairs of the village and the maintain peace and security.

The close proximity of the district to Mathura in the east and to Bairath in further west, lends to an area an antiquity of epic age when Matsya inhabited this region. This tribe is mentioned in Rigveda along with other Aryan tribes. It flourished as a Mahajanpada in the time of Buddhistic Anguttara Nikava. The Matsya also suffered to in the ancient Jaina Prajnapana and the Mahabharta extol the purity of their social and religious systems. They also appear in connection with Vasas in the Kaushitaki Upnishad and with Salvas in the Gupta Brahman. According to Manusmriti the matsya were included in the Brahmarshidera and

they appear as one of the select few of the Aryan races noted for their devotion to Brahmanical ideals.\(^1\) Regarding the extent of the Matsya settlement, it lay to south the south of Kurus of Delhi and to the west of the Surasenas of Mathura, southward it approached the Chambal, while westward it reached the forest skirting the river Sarvasti.\(^2\) To be more exact it thus comprised the modern Alwar-Jaipur-Bharatpur territory with Viratnagar (modern Bairath) as its capital. The epic associates salvas with kuru-Panchalas and they probably occupied what is now the district of Alwar. Matsya was allies of the Pandvas in Mahabharata war\(^3\)

The discovery of the Minor rock Edict of Ashoka at Bairath\(^4\) goes to prove that this region was included in the Mauryan Empire (Plate 2.1). The disintegration of the Mauryan Empire was followed by the invasion of foreigners and evolution of small principalities. The punch marked coins belonging to the period of Heliokes, the Greek king of Bacteria and that of Apollodotos, Menander Antialbidas and Heraios found at Bairath,\(^5\) further lead to the sunrise that Bairath and the country around it formed part of the Greek dominions.

After the fall of the Pushyamitra and the end of the Greek invasion in the closing years of the first century B.C., the rules of

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4. Indian Archaeology – A review (1961-62 and 62-63) Department of Archaeology Govt. of India, New Delhi, p.38 and p.18.
5. Ibid.
the rural republic, Yaudheyas and Arjunayans, appears to have emerged in the lands within the triangle Delhi-Jaipur-Agra. This is further corroborated by the discovery of an inscription of about third century A.D. of Yaudheyas Vijayagarh or Bijaygarh near Bayana.¹ That the early Kushan power extended to this region is testified by the discovery of a large number of Kanishka² records at Mathura as well as by the sculpture found at Noh and Aghapur in the district. At Noh, the excavation included a spotted red-sendstone sculpture of early Kushan date, depicting for Maitreyas. At Aghapur, a few painted greyware shreds along with two fragmentary Kushan Sculpture were discovered.³

Three types of coins struck by Yandheyas are available. The first of these, bearing the legend Bahudhanaka Yadheyanam showing that these were stuck by the Yandheyas at Bahudhanaka are assigned to a period about the end of the first century B.C. The second type of coins, both silver and copper, was issued in the name of Brahmanyadeva Kumara, the tutelary deity of this people and is assigned to the third century A.D. The third type of coins in copper showing Kushana influence may be assigned to the third and fourth century A.D.⁴ An inscription dated A.D. 372, on a sandstone pillar in Bayana for refers to the Varika king Vishnu

². Ibid
³. Indian Archaeology – A Review (1961-62 x 1962-63) Department of Archaeology Govt. of India, New Delhi, p. 38 and 18.
⁴. The History of Culture of Indian People, Vol.II – The Age of Imperial Unity, Bombay (1960) p.32.
Vardhan, who was a tubutary of Samudragupta. Vijaygarh or Bijaygarh near Bayana was an important centre of administration in Gupta period.1 Near Naglachhela, south-east of Bayana, the largest hoard of coin of Gupta period was discovered and Gupta sculpture have been found at Bayana, Kaman, Nehar and Pagone.2

The Gurjaras came into prominence about the second half of the sixth century and from the writing of Hieun Tsang, it may be concluded that the portion of this district fell within the ancient Gujarattra of Gurjara country.3 Its capital was located at Bayana4. Inscriptions suggest that the Gurjara Pratihara Kings Bhoj I and Mahipala II held their sway over the area extending up to the district.5 In the later period of Pratihara supremacy, the Kingdom of Vatsaraja the Pratihara King included Malwa and east Rajputana.6 Najphat II of this dynasty had definitely a hold on Matsya which is proved by the Gwalior inscription.7

In the ninth century, a branch of Chauhan family ruled in Dholpur apparently as a feudatory of the Imperial Partihars of Kanauj.8 The king Jaitapala of the traditional list of Yadu dynasty may be placed in the first half of the seventh century. His

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1. Imperial Gazetteer of Indian People, Vo. VII, Oxford (1908) p.137.
7. Ibid.
8. Ibid.
successor was Vijayapala who may be identified with King Vijaya of Bayana inscription date 1044 A.D.¹

The ancient history of Bharatpur district does not lend itself to a comprehensive and systematic account. Yet archeological evidence makes one thing clear that the region has remains in the occupation of different rulers in different period and that they have all left their cultural imprint upon its physical landscape. It is clear from foregoing analysis that the region was continuously settled from ancient to medieval period, though it is very difficult to trace the pattern of settlement during the different periods, until extensive excavations are conducted, which is impossible on account of the high density of population in the region.

1.3 Medieval Period

In 12th century the Ghurida invasion had destroyed the Chauhans power in north India Prithviraj was defeated in Tarain. In 1195 A.D. again came to India and attacked Bayana, where upon Kunwarpal, the chief of Bayana evacuated his capital and entered himself in Thangarh which he had to surrender after a short siege. The several stronghold and strategic outpost of locality were then occupied and garrisoned and command of this frontier between Rajputana and Doab was entrusted to Bahauddin

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After the death of Qutubuddin Aibak the hold of Turks over Bayana weakened, owing to the efforts of the dethroned rulers who were endeavouring to revive their power. Iltutmish’s successor were weak and the continued depredation of the turbulent people of Northern Alwar region known as ‘Kohpayah of Mewat’ hampered their success considerably. Actually, Mewat or the country of Meos which included the district of Mathura, Gurgaon and part of Alwar and Bharatpur states became an abode of notorious rebels and a source of constant trouble to the rulers of Delhi. The Yaduvanshi Rajputs of Bayana and Tahangarh having been deprived of their stronghold and territories, had migrated to this region of Mewat. It appears that the parts of this area remained under the sultanate of Alauddin Khilji as well. He once consulted Qazi Mughiruddin of Bayana as to the legality of his new regulation and measures against Hindus.

During the reign of the later Tughlaqs the turbulent Mewati became more turbulent. Sarang Khan the governor of Dipalpur was also becoming hot-headed and had dislodge Sharika Khokhar. He attacked Khizr Khan at Multan which was occupied by him (1396 AD). Consequently Khizr Khan had to flee and sought refuge with Shams Khan Ahudi at Bayana. Shams Khan was Amir of Bayana from about 1397 to 1416 AD. After the departure from Delhi Timur

1. The history and culture of the Indian People, Vol. V – The Struggle of Empire Bombay (1957) p.120.
defeated Shams Khan Ahudi, but without occupying Bayana he pushed to Katehar. Later Bayana was captured by Mubarakshah. After the death of Mubarakshah, the power of Sayyed dynasty began to decline rapidly and Sharqi rulers of Jaunpur tried to make the best of situation. Being related to the late dynasty, they aspired to succeed to sultanate of Delhi but their place were foiled by Bahlot Lodi but the long reign of Bahlol Lodi was marked by constant disturbances from Sharqi rulers who never gave up hopes of supremacy.

Sikandar Lodi who succeeded Bahlot at Delhi captured the Bayana and Dholpur. He replaced Vinayakdeva by Qamaruddin Ibrahim Lodi the successor under took an expedition against Rana near Dholpur.

The second quarter of the sixteenth century marks and establishment of Mughal Empire which contained till the middle of the nineteenth century. Babur fought against Rana Sanga at Khanua village now in Rapbas tahsil of the district. After the battle of Khanua, Babur victoriously marched on the Bayana and took possession of it. He reduced Mewat on 7th April 1527, entered its capital Alwar in triumph.

The strong hold of Bayana continued to be an important military outpost. Under Akbar, portion of this district comprising the Mahals of Bayana, Bari, Toda Bhim, Khanua, and Dholpur fill
within the *Sarkar* and Suba of Agra while the tahsil of Gopalgargh, Nagar, Pahari and Kaman were with Jaipur state.¹ The region around Rupbas was favourite hunting ground by the emperor. Raised slabs of stones or Chabutras are still to be found in the Channah close by, from where Akbar used to shoot.²

The district during the reign of Jahangir and Shahjahan retain the importance. Dholpur remained the seat of imperial subahdar of whom Fatullah Khan and Mahabat Khan built, during the region of Shahjahan, new suburbs built called 'Fatehabad' and Mahabat Nagar. During the reign of Aurengzeb in 1668 A.D. the jats rose under two new leadership Rajaram and Ramchakra the petty chief of Sinsani³ and Soghar.⁴ They built several small ports in the almost trackless Jungles, strengthened these with mud walls that could defy artillery even today, the fort and city of Bharatpur surrounded by motts and mud walls.

After the death of Auraggzeb, the Mughal empire decayed rapidly owing to weak successor and internecine faction. In this period of turmoil various principalities become independent. The influence of Jats became very power. In 1722 marks the recognition of Bharatpur as a separate state. Badan Singh built four new fort viz. those at Deeg, Kumher, Bharatpur and Weir. In

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⁴ Ibid.
1733, Suraj Mal had shown signs of promise when he captured the fort of Bharatpur from Khemkaran, the rival chief, whom he killed and laid the foundation of Bharatpur city. Surajmal was the most powerful man of Jat he captured many fort and jagirs.

Political condition was changing fast Ahmad Shah Abdali was hovering over north India and Marathas were advancing their power beyond their usual fortier. In the third battle of Panipat (1761) the Marathas were crushed. Death of Suraj Mal created family dissension concerning the succession. Jawahir Singh the successor made elaborate preparations for the war against the Najib Khan. He hired Malhar Holker a Maratha army of 20,000 horse for 22 lakh of rupees. He captured the fort of Ballabhgarh which was to serve as a base for operation.

Madho Singh invaded the Jat territory in 1768 and a battle was fought outside the Kaman. The Jats were defeated and after the death of Jawahar Singh, the power of Jats began to decay and their dominions began to shrink.

The fall of Mughal Empire, coupled with the exit of Marathas, Jats created condition of insecurity in it. So a large number of fortresses (garbis) were built by Jats, commonly of mud for defense purpose. The remains of these garbis may still be seen at many places. These were buildings of considerable strength around each of which a large number of settlement emerged.
1.4 **Modern Period**

The *zamindars* fought desperately against the British to save the region from their hands but failed to do so, as a result, political confusion prevailed in the area which led the rural people congregated in large village for security.

The early years of the nineteenth century were marked by rivalry between the British and the Marathas to attain supremacy. On the outbreak of Maratha war in 1803, Dholpur slipped from the hands of Sindhia into those of the British and the treaty between the East Indian Company and Raja Ambeji Rao provided their parganas of Bari, Dholpur, the fortress of Gawalior and Rajkhera, along with other areas should hereforth be in the possessions in of the former and these could be disposed by the company in any manner it liked.\(^1\)

After 1857 the region was fully controlled by the British Government, during the time many department such as judicial and revenue, were started and tehsil and thanas were established and system of maintaining records were introduced. The principal events of this period were opening of railways in 1873-74, the famine of 1877, the agreement of 1879 for suppression of

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manufacturing of salt, the absolute of all transit duties save those on liquor, opium and other intoxicating drugs.¹

Introduction of railways was an important milestone in the evolution and growth of settlement in this region by the beginning of twentieth century, industrial activities had been firmly establishment and had diversified in the district. The important industry were cotton, salt, crude glass, bottle etc and these were manufactured in various part of the district. Close on heel of industries and agriculture development trade also flourished in the district. The impact of railway was much greater and export of food grains, oil seeds, raw cotton, ghee, metal, sugar, hids and Indian piece goods was made possible. Bharatpur being a good halting place for travelers to and from Delhi, Agra, Mathura, Jaipur. Many Saries were established on the periphery of the town. Along its entrance road many new settlements was found. The Bharatpur district was divided into a number of administrative units, subdivision (tehsil / pargana), thana and revenue village. Though British like their predecessors, did not interfere in the village organization in general, the pattern of settlement was considerably modified after the establishment of their rule. The people began to move out the confines of their villages, construction their new dwelling in open space near their field, a fact which subsequently led to the development of hamlets.

After independent (1947), the settlement in the study have witnessed a general tendency of dispersal, because of changed economic conditions, loss of holds traditional as well as other socio-religious belief and customs, the abolition of zamindari system, the consolidation of land holdings, extension of means of transportation and Communication, electricity, irrigation, banking and marketing facilities to the rural areas, improvement in the methods of farming with use of high yielding verities of seeds, fertilizers, pesticides and new farm machinery all have contributed to this trend in recent years. The phenomenal increase of population and consequent demand for more land for farming and housing has only led to the wide spread shrinkage of forest cover also to the reclamation of usar (barren) lands. The new administrative institution like Development Blocks and panchayats and public building belonging to Primary school, rural health service, panchayat bhawan (village council house), community etc. have contributed a lot to a change in rural landscape of the study area. A large number of new settlements have grown up around these centres. The programme of providing house-sites and credit facilities to Harijans and landless labourers, the massive dive for linking the village having more than 1500 peoples with main road, the extension of health services and drinking water facilities to village have made their impact on settlement pattern in rural areas
of the district. Due to these development, new settlement sites are emerging closer to the fields or long the transport road.

2. **PLACENAME ANALYSIS**

Place-name analysis has enjoyed much importance in the field of settlements histogenesis as it is a valuable source of the study of the evolution of cultural landscape, especially those of rural settlement. According to Brunhes, place-names are fossils of human geography.\(^1\) The study of place-names help to trace the evolution of rural settlements because their suffixes and prefixes are closely related to the physico-cultural background of an area, since there is an complex relationship between names and places and geographical surroundings. Kemble (1849) discovered the significance of place-name ending in ing and ingham in the evolution of Saxon settlements of southeast England. The suffixes point to the clans which had settled in the places which now bear their name.\(^2\) Alice Mutton (1938) has traced various phases of the settlements of the Black Forest areas, based on the evidence furnished by the place name ending and their distribution.\(^3\) Dickinson (1949) has studied the evolution of German settlements with the help of place-name suffixes. He has traced the evolution of

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plans of rural settlement and discussed the distribution of settlement type in Germany with the help of place names.¹

Indian villages have varied nomenclature and even in the same region there are diversities because of variations in physio-cultural and socio-economic condition at micro geographical environment which provides dues to the evolution, growth and decay of earlier human settlements. It has been found that different place names have been assign to same place in different historical periods. Such changes of place names are due to change of people inhabited them and have also resulted from changes in their socio-economic condition. During the course of field studied related to the present work, it has been found a large percentage of the names of Bharatpur District have suffix or prefix like Pur, Pura, Nagla, Garh, Garhi, Sarai, Khera, Khurd, Kalan, Mafi, Chak etc. and these affix usually refer to a ruling chief. Maxwell (1965) has successfully traced the origin and evolution of settlements around Sheffield through various phases of its colonization on the evidence.² Nitz (1972) has attempted to trace evolution of Teutonic settlements in southern and Western Germany with the help of such evidence. He points out that when belligerent group of Teutonic folk had permanently settled down, they named their

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settlement after the groups of inhabitants who again named themselves after the head of leading family. According to him, village name with suffix ingen added to a person’s name belong to the period of Teutonic colonization or a God or Goddess and or the topographical feature or the vegetation of the area. Thus it may be inferred that village are somehow or the other associated with physico-cultural and socio-economic conditions of the region. So Place-name analysis has been used as a tool to trace the evolution of settlement.

According to local tradition claims that the Bharatpur is named of Bharat, the brother of Lord Ram of Ayodhaya, whose younger brother Laxman was worshipped as the family duty by the rulers of this state and whose name was engraved in the state coat of arm and seals.

2.1 Place-names Associated with Culture

The history of Bharatpur shows the region has a very ancient culture and tradition. A major portion of Bharatpur District which is near to Mathura has Varaj culture. The word Varaj or baraj, in vedic literature, in the Ramayan and Mahabharata has been used for ‘cowshed’ and pastoral land. Mathura the heart land of the baraj culture was noted for its pasture land, forest and horned cattle, especially cows. Bharatpur District, having close links with

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Mathura has therefore many place-names associated with baraj culture.

A large number of Hindu gods and godlings also influenced the cultural setup of the region. Place names such as Kanua, Darkaula, Karasusna and good examples of this. Besides this there are other religious monuments which influence the rural life of the people of the district. Such as Sivalinga and Yaksha figure depicts the culture. Other important monuments are two temples, one of Lakshmanji the deity of the ex-ruling family and other dedicated to Ganga.

There are nothing peculiar about the Muslim culture of the district. The pattern is more or less the same as the other part of North India. A mosque called Jama Masjid and Moti Mahal are two example of Muslim culture in the District.

2.2 Place-names Associated with Forest

From the study of various place-names of the district it appears that the region was once largely covered with forest, thickets, shrubs and groves. From the traditional account of the district contained in the files of the district, it appears that a fairly large number of villages were under forest cover prior to being inhabited. The presence of words having associated with different kinds of vegetation such as Khandi, Ghana, Juraiya, Arangai, Jhau, or Jhan and Shikar, in large number of village name
BHARATPUR DISTRICT

DISTRIBUTION OF DIFFERENT PLACE NAMES

PLACE NAMES ASSOCIATED WITH

- Culture
- Forests
- Topography and siting
- Animal
- Caste and community
- Age and size of settlement

- - State Boundary
- - District Boundary

Fig. 2.3
suggested that these places were once covered with forest or thickets. In addition to these, there are villages which are named after trees found in the forest e.g. Armi, Jamun, Dhak, Mahua, Imli, Shisham, Bakagen and so on.

It is obvious that the region was covered with fairly dense vegetation which was subsequently cleared by the inhabitants during the course of settlement. Hence there are many villages indicating the burning or clearing of forest, such as Bankati, Barotha, Jarothi, Barauli, Jaroth etc. denoting a settlement founded after the cutting down or burning of forest. Other names like Jaraiya, Amni, Kadhi and Janera signify the forest settlement.

Many villages in the district are associated with Pipal trees such Pipalgaon, Pipalgarhi, Pipalnagla etc. Similarly various villages have name after various trees such as Imlani, Imlia, Maho, Mahua, Khajurauth, Neemkhera, Kansera etc. these names indicated their close association with different trees.

2.3 Place-name Associated with Topography and Siting

Various villages found in Bharatpur District indicates the names associated with different topographical features like rivers mound depressions, and characteristics of soil such as Kherwa, Kheragaon, Pahari, Nagar, Pehpur, daryapur, Gangapur, Bhawan Nagar. These names indicated the village bearing various places names have closely associated with rivers.
2.4 Place-name Associated with Animals

Tiger or Bagh is the only wild animal with which some of the village place names are associated like Baghraya, Bhaghayia, Baghan are examples of this. The location must have covered with forest having wild animals in the past. Some of these settlements which came into existence as a result of the clearing of the forest land might have been occasionally visited by tigers.

2.5 Place-name Associated with Caste and Community

There are so many village in Bharatpur District which have been named after caste and communities inhabiting them such village are mainly hamlets that are attached to main village. Nagla Chamar, Yadupur etc. are villages named after the communities of scheduled caste and backward class. Many village are name of Muslim caste and name such as Khanpur, Kheri Allauddin, Shahzadpur, Nagla Firozpur etc are example.

2.6 Place-name Associated with Age and Size of Settlement

There are various villages using suffix and prefix like Khurd, Kalan, and Pur, Pura, Nala, Garh, Garhi, Nagar etc. indicate the size and age of villages. Village names ending in Kalan or Khas and Khurd or Pura designate generally the earlier and late settlements respectively and 'big' and 'small' as there Persian word¹ imply Chaniyan Khurd, Fateh Kalan, Fateh Khurd, Raipur Khurd, Semla

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Khurd, Semla Kalan are examples of such names. Similarly village names having terms like garh and garhi suggest former seats of the local chiefs where the people used to assemble for safety and security. Gopalgarh and Bhanpurgarhi are example of such village.

3. **TERRITORIAL EVOLUTION OF CLAN SETTLEMENTS**

The dominant corporate group always occupied the key pint of territory and allowed other, non corporate groups of men and women, to settle on land given on them order to carry out their socio-economic activities within its organizational framework. Thus territory formation was the first step in the process of setting at lower level. Due to this there has been a strong link between settlement pattern and economic activity. Territory formation is the initial stage was not usurpation of a region but the occupation of virtually virgin or thinly populated land by a group of people on a small scale. Such an area had enough scope for expansion of settlement and development of socio-economic and political institution with a view to ensuring peaceful existence and defence. During the course of land occupancy and actual settling process, emotional and historical ties developed among the inhabitants, which tended to bind them to live together in a territory. Such a territorial occupation required autonomy for the occupants to function as a viable unit. Many cultural institutions such as

shrines, market, fairs and places associated with gods and godlings came up in the course of the settling process and these made the inhabitants feel that some places were vital for, the wellbeing of the group and must be defended. The occupied land, the shrine, the family burial ground and sites of local festivals also generated a sense of belonging to the territory among the settler which was shared by the non-corporate group with those of the corporate political group. As such, the territory becomes a complex symbol of possessiveness, means of sustenance and well being and security and culture evolved over a period of time.

At the time of original occupancy there was no fixed territory system. However, later, these territories developed as clan based republics headed by their chief.1 During the medieval period there was three - level political structure is almost all parts of India. At the top was Delhi or central government, in the middle was the regional or provincial administration and at the base was the hegemony of the local dominant corporate group. An occupied territory generally termed raj or laga, was the primary clan area and came to be known as Pargana. The Pargana was segmented into sub clan or secondary clan areas known as tappas, which were sub-divided into smaller territory units were known as gaon (gram). As a results of these three tier division, there evolved a

hierarchy of settlements, the original chief settlements at the Pargana and tappas levels developed as quasi settlement because of their respective territory and sub-territorial commands of leadership and resources, whereas the gaon evolved as the basic rural unit of settlements with local resources utilization and political power. Under the prevailing linear political system, these three units i.e. gaon, tappa and Pargana were territorially structures on the functional principles of kinship and descent from the ancestor or founder of the dominant clan. These settlements were, thus arranged on the basis of hierarchy, both aerially and functionally from the very beginning and counted to remain so until forces of modernization broke them up.

During British period, a five tier territorial systems of introduced i.e. Pargana, tappas or turf, taluka, patti and grass and gaon in descending order. The Britishers brought about enormous changes in the civil and administrative set up. The Pargana were maintained as sub-divisions of Tehsils and were used as revenue units, and they continue to function as such. Earlier, tappa was used as a fiscal division, but later British recognized the tappa as a sub-clan territory. Not only were taluqdari and zamindari and other territorial rights of land corresponding to them given weight,
but they also formed the basis of surviving and records of holding rights.

The foregoing discussion reveals that different people and societies had introduced their own methods of spatial organization and agriculture system, which, during the course of time, intermixed and metamorphosed and thus the present territorial system, was evolved which has a distinct structural pattern.

The present study focused on the various clan of the Bharatpur District from sixteenth to twentieth century, who functioned as corporate territorial groups and served as dominant local power in different parts of the region. So the study is based on information contains from Archaeological evidence, Ain-i-Akbari and misli-Bandobast (miscellaneous paper of revenue settlement of 1866). Information from local tradition is also supplemented.

During Mughal's reign Akbar (1556-1605) introduced the new unit of administration i.e. Sarkar. Under Akbar, portion this district comprising the Mahals of Bayana, Bari, Toda Bhim, Khanua, and Dholpur fell within the Sarkar and suba of Agra, while the Tehsil of Gopalgarh, Nagar Pahari and Kaman were with the Jaipur state.¹ The Sarkar of Agra contained 33 Mahals. The Malikan or Zamindars of land were Rajputs and only in six Mahals. Agra, Bayana, Chou-Muba, Khawah, Kathumar and

Hinduan, the Jats along with other were in the position of zamindari. The conflict between the Jats and Rajputs was of two types, first, where the Jats who were made mere cultivators tried to become zamindars and second, where the Jats who were holding zamindari tried to acquire more. The leadership of Jat uprising was, mostly in the hands of the Jats who were already in possession of land and may be called zamindars. And their conflict with the Mughal authorities and the Rajputs was a some extent a struggle for both land and social status. As the Jats had by this time risen into prominence and had extended their zamindaris in the region between Agra and Mathura to the borders of Amber, it was but natural that they should have caused concerned to the Mughal empire as well as the ruler of Amber. After the death of Raja Ram, the Jats had once mobilized under the leadership of his Fateh Singh and were causing trouble in the region, under this situation the emperor choose Bishan Singh who had succeeded to Gaddi of Amber after the death of his father Raja Ram Singh, to under take operation against the Jats. As a result Bishan Singh was appointed the faujdar of Mathura in the place of this father and also granted the faujdari of Kheri and Sarkar. He was also given the zamindars of many Jats village viz. Thus, Kho, and Sinsini, in the Pargana of Ao, the stronghold of Jats. The emperor also promised an increase in his mansab and a Jagir worth the

Jamah of Amber if the Raja subduing the Jats. Hitherto the Rajputs were dominant zamindar group in this region and the extension of the Jat power in this region would be the cost of Rajput zamindars. Thus it threaten the economic interest of Rajput zamindars. Secondly since the Rajputs considered themselves socially superior to the Jats, they were rightly concerned by the threat posed by the activities of the Jats. Thirdly a large number of the Jats had already settled themselves within the territory of the Raja and the Jats of Ranthambore had once created disturbance under Rajaram during the time of the Bishan Singh’s father Raja Ram Singh and seemed to be in alliance with the Jats of Sinsini.

However after a difficult campaign in the territory of the Jats the Mughal under the command of Prince Badar Bakht and Raja Bishan Singh succeeded in capturing the fort of Sinsini from the Jat leader Fateh Singh. The capture of Sinsini rendered a severe blow to the Jats and created internal discussion among the Jats, though it did not crush the Jat power. The Jats now having lost their faith in the abilities of Fateh Singh, rallied themselves under Churanman, the brother of Raja Ram.

In the year 1722 marks the recognition of Bharatpur as a separate state. Badan Singh’s successor Suraj Mal was the most

1. Udairam to Bishan Singh, 17th August, 1689, VR. R.A.B. No. 188.
important chief of Bharatpur. He laid the foundation of Jat kingdom. Here it is pertinent to note that the east while rulers of Bharatpur (before the formation of Rajasthan) belong to the Jats of the Sinsiwar clan and claimed the descent from Madan Pal, a Jadon Rajput and third son of Pal, who ruled in the eleventh century A.D. at Bayana and subsequently acquired possessions, which later on formed Karauli state. It is said that any of the Madan Pal's descendants, Balchand, kept a Jat women as his concubine and by her two sons, Bijaj and Sijay, who were not admitted into Rajput brotherhood but were regarded as Jats. Having no gotra or clans of their own, they took the name of Sinsiwar from their paternal village, (Sinsani 13 km south of Deeg). The chief of Bharatpur traces his descent to them. After the decline of Jats the Sindhiyas occupied the three more district. There fourteen Parganas of the state of Bharatpur were rearranged subsequently into ten tehsils for administrative convenience.

The ruling family of Dholpur state were Jats of Bamraolia clan, the later name being derived from Barmaroli near Agra, where an ancestor of the family is said to have hold lands in about 1195 A.D. They joined the Rajputs, against the Muslims and received the grant of the territory of Gohad about 1505 A.D. when they assumed the title of Rana.

2. Ibid, pp.245
Britisher controlled the entire district of Bharatpur and the rulers of district was only given her power as a zamindari. In 1862, 'Adoption Sanad' were granted to the ruler of Bharatpur and Dholpur by British government. It provided that 'on the failure of natural heirs, the adoption by yourself and future rulers of your state of a successor according to Hindu law to the customs of your race, will be recognized and confirmed.'

The Matsya Union consisting of Alwar, Bharatpur and Karauli states was inaugurated on 17th March 1948. Among the princely state of Rajasthan, this was the first union to be formed. There was the beginning of the merger of all the Rajputana states to form a single state in the Indian Union. The Matsya union was merged with the United states of Greater Rajasthan on 15th May, 1949 and with Rajasthan on 26 January, 1950.

In time-honored social classification of Hindu Society based on Varnashram is only faintly visible in the present conditions in the district. As elsewhere, Hindu society is divided into numerous castes and sub-castes. However, a short account of the principal clan, caste is given below.

**Brahmins**

Numerous in Dholpur division, the Bramins are spread all over the district, because, in the Hindu social system, they

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1 Khadgawat, Nathuram, Rajasthan role in the Struggle of 1857, Jaipur (1857) p.72.
performed many religious rites. Traditionally Brahmins are priests in Hindu temples. There are no less than 200 big temples in the district and each of them has a Pujari – worshipper. According to 1961 census Brahmins was one of the numerically dominant castes in the area now covered by Dholpur Sub-division (now a new district). The principal sub-division of Brahmins in the district are Gaur, Sanadhya, Saraswat, Gautam and Chaturedi. Chaturvedi is sub-caste. At Bharatpur and in the area nearly, there are quite a few households of Chaturvedi Brahmins. They are known as Mathur Chaturvedi, since they are said to have originated from Mathura. Chaturvedis are further divided into Karva (bitter) and Meethe (sweet). Both are endogamous group.

In Bharatpur District sub-division, villages Devaka, Margarh, Hetalpur, Adampur, where founded by Brahmin zamindars. In Dholpur sub-division there are fifteen village which were held by the Brahmin zamindars round about 1600 A.D. Village Ami, Nagla Ansoo, Balipore, Andla, Kasison, Nandpurpala, Nayela, Beharipur, Bhojpur were founded by the Brahmin zamindars. In Nadbai one Keshav Brahmin acquired a forest from the Poruch chief of Daryapur, and after clearing it, founded a village thereafter his own name i.e., Nagla Keshav. Village Nagla Jodha was founded by Jodha Ram a Brahmin cultivator. In Khaira, Brahmins founded many villages in the sixteenth century. Village Khutipura, Rathbhanghar, Senpur, Darshana and Mohanpura may be sited as
example of such settlement. During the succeeding centuries, the position of Brahmin zamindars was further strengthen. Enjoying the privilege of being the priestly caste, the Brahmin acquired a number of villages as muafi (free hold) lands. Later, they extended their zamindari possessions even more and, as bankers and money lenders and thereby acquired a large number of other villages.

**Jat**

While the Brahmins hold pride of place in the social structure by reasons of the functions traditionally assigned to them, the Jats, as ruler, held an important position in the district and are owners of soil. Both at Bharatpur and Dholpur the ruling families are Jats. The Jats are numerous in Bharatpur subdivision.

There are different views about the origin of the Jats. According to one story, the Jats take their name from Jata malted hair of lord Mahadeo. To Mesfield the word jat is nothing more than the modern Hindu pronunciation of Yadu, to which Krishna belonged and which is now represented by the Jadon Rajput. According to yet another view, the family of Jadons, a section of Thakurs from which the ruling chief of Bharatpur claim descent, sprang from Jad, and one of the five sons of Raja in Bengal hundreds of years ago.

1. Crook, W., Tribes and Caste, 1896, p.246.

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The jats are descendants of early Aryan invaders and they are predominantly found in part of Bikaner, Jaipur and Marwar. Their present in Bharatpur District is due to more recent invasions.¹

The exogamous gotras of the jats in the district are Sinsiwar, Sogarwal or Soganiya, Khunteta, Bhagore, Chahor, Chaudhary, Nauriwal etc.

In social hierarchy, Jats do not consider themselves below the Rajputs in the Bharatpur sub-division where they are in large number. In this connection it is important to mention that Jats, Minas and Gujars may all smoke together, and eat together out of the same degchi but not the same thali.²

**Gujar**

The third important caste in the district is Gujar. Gujars are considered kshatriyas below the Jats in social hierarchy. The Gujar is a man of flocks and herds, while the Jats are industrious and skilled agriculturist. In Bharatpur there are two types of Gujars: Khare Gujar and Laur Gujar. The former are principally engaged in making butter and ghee.³

During 16th century the Gujar estates are not mentioned but in 1874 A.D. they were numerous in the district. The Gujars are of

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¹ Census of India, 1931, p. 123
² Medico - Topographical Gazetteer, Eastern Rajputana states, p32.
³ Tribes and Caste, p. 440.
very unsettled people and adopted the habits of plundering and cattle lifting. There favourite home in the district is in the jungle tracts in khaddars of Gambhir and Ruparel rivers, were the rough, uncultivated waste afford them good pasturage for their cattle. During the latter half of the past century and the first quarter of present century there were several powerful Gujar chiefs in the district, but their possessions have been much reduced during the old settlement. At the end of the last century Jeet Singh Gujar of Parikshitgarh was one of the most powerful Hindu chieftain in the district. The Gujar have zamindari possessions in Kaman, Dholpur, Rajkhera and other adjoining part of the district.

**Chamar (Jatav)**

The other important community in the district is Chamar or Jatav (Cobbler). The sub-caste of the Chamar are: Chamari, Bhambi, Jatav, Jatia Mochi, Raidass and Raigar or Ramdasia. The Chamar are traditionally carriers, tanners and day labourers. The present name of the caste, namely Chamar, is a corruption of Charma –Kara, ‘a worker in leather’. Originally a single community, it was dismembered over the years into the different sub castes referred to above. The sub-caste are endogamous group which follow the rulers of exogamy different from one another. Amongst themselves, the Chamar consider those inferior who dispose off dead animals and eat beef. Many of the Chamar now call themselves as Yadav because they argue that Jatav is a
corruption of yadav. The caste Panchayat in this community are very important for they discuss issue relating to connubiality, illicit sexual relations and jajmani. It is however true that the sanction of caste Panchayat is not so effective now at it was formerly.

**Mahajans**

Most of the Mahajans in the district are Jains and their principal division are Saravgi, Agrawal, Khandelwal, Vijayawargi, Maheshwari, Porwal and Paliwal. The Saravgi are jains, the word Saravgi is a corruption of Shrawak, a Jain worshipper. They are very strict in their observances and carry the reverence of animal life to an extreme. They neither permit martial or commercial relation with Oswal, nor do they engaged Brahmins to officiate at their wedding. They have Pandits from their own community. Khandelwal Mahajans originally came from Khandela village in Sikar district. The people of this caste are Digambar Jains. Vijayawargis also came from Khandela village and are mostly Jain businessman. The Mahashwaris are Hindus, they traces their descent from Rajputs, Chiefly from Chauhan, Partihara and Solanki clans. The name of the caste is derived from Mahadeo or Mahesh, who is an important deity of this caste. The Maheshwaris consist of 72 exogamous groups. The Porals are said to be originally Rajput of Patan in Gujrat where they embraces Jainism some seven years ago. The Oswal and Porwals intendine but do not
inter marry. The Porwals are also mostly traders and money lenders, they are indigenous bankers.

**Meos**

Meos from a large community in Kaman and Bayana tehsil of the district and in the contiguous district, namely Alwar. They are Muslims believed to be formerly Hindus, estimates vary with regard to the time when their conversion to Islam took place. The Meo community is exposed of fifty two clans, of which the large twelve are called Pal and smaller ones, gotras. Further subdivisions within a Pal are known as thana a group of those members of pal who distinguish themselves as being the progeny of a particular son of Dada (forefather of the Pal). The minimal social unit is ghar (family) which fairly approximates to the joint family known for the predatory acts in days gone by, Meos are now primarily agriculturist many of them big farmers.

Every pal is headed by a Chaudhary who wield great influence on the members of his unit. He is economically well off and socially respected. Jati-Panchayat plays an important role in enforcing ruler of exogamy, in defining conditions of divorce, in punishing cases of breach of promise for marriage and checking cases the sale of gials.

**Others**

There are occupational caste too in sizeable number in the district, the Kolis are found in the district, their traditional
occupation is weaving, most of them are also good masons. The other are Khatis or carpenters, Lohar or black smith, Sonars or gold smith and Nais or barbers. Nai is an important caste, for beside being barbers, they are traditional match makers. The presence of Nai is essential on almost all the ceremonial occasions, particularly at the time of marriage when they cut hair of baratis (members of marriage party), bathe the bridegroom and also work as groosman. For the service rendered, they are paid both cash and kind.

On the basis of the above discussion about the different zamindari clans from the very beginning to the mid 20th century. It may be concluded that Jat occupied the first position everywhere in the district till last. Bharatpur district is always dominated by Jats.

4. DIFFUSION OF SETTLMENTS

The study of spatial diffusion occupies a central place in geographical researches. The word diffusion from the verb 'diffuse' means to disperse or is from a centre; to spread widely, disseminate the Oxford English Dictionary).

The work on cultural as well as settlement diffusion could be traced in the frontier the of Turner1 in American history, Bowmen's.2 Pioneer and Zoerg's1 Pioneer settlement: Cooperation

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studies the classics of that period. During the thirties sauer and Brand.\textsuperscript{2} (1930) collected archaeological evidences from pueblo-sites and attempted to deduce the culture areas and successions in southeastern Arizona. Stanislawsky.\textsuperscript{3} (1946) traced the diffusion of the grid pattern in the Americans. The cultural diffusion idea was propounded by Sauer\textsuperscript{4} at world scale. Mitchel and Sandner in 1954, 1961 respectively. (1952). Chisholm\textsuperscript{5} (1962), however, emphasized four major changes affecting diffusion of new settlements. Firstly, socio-economic changes in land-holding system help in depression of settlements, secondly removal of the need for defensive agglomeration lead to hamletization in several parts of India, thirdly, elimination of such factor, like lack of water and disease etc. as improvement in water supply attracted settlers in canal irrigated areas in Rajasthan and Haryana and malaria free zone of Tarai region in Uttar Pradesh. Fourthly the systems of land holdings are mainly responsible for diffusion in industrialized area. Singh (1968) analyses the spatial diffusion settlements in eastern Uttar Pradesh through physico-cultural forces.\textsuperscript{6}

The progress of colonization has been discussed through five stages corresponding to cultural periods represented by various

\begin{itemize}
\item \textsuperscript{1} Zoerg, W.L.G. (ed.), Pioneer Settlement, American York, 1932.
\item \textsuperscript{3} Stanislawsky, D., 'The Origin and Spread of the Grid F Review, Vol. 36, 1946, pp. 105-120.
\item \textsuperscript{5} Chisholm, M.D. 'Rural Settlement and Land Use, London 1968, p. 99.
\end{itemize}
ceramic assemblages:

(i). Initial stage of human colonization.
(ii). First stage of human colonization Pre 1200 B.C.
(iii). Second stage of human colonization (B.C 1200-200 B.C)
(iv). Third stage (early 2nd B.C - Late 3rd A.D) c
(v). Fourth stage (Early 11th A.D - 1857).

The Aryan colonists from their first settlements in the Punjab gradually migrated southeast and eastwards down the Ganga valley (2500-2000 BC.) in perhaps two principal branches: One branch moved eastwards and established in the Ghaghara valley in Avadh with its capital at Ayodhya (near Faizabad) while the second branch moved along the Ganga and first occupied the Yamuna Ganga doab. Gradually the whole region got colonized into petty kingdoms comprising numerous villages

I. Initial Stage of Colonization

The initial stage of the colonization of the area is represented by the use of Late Harappan Pottery. In the study area only one settlement has been found at Pengora of the Late Harappan. Even for Yamuna region nearly 70 settlements were found. The settlements are generally located on the banks of the rivers and were small in size, although a few of the larger ones are up to 4 hectares in area. The size of the settlements indicates a resident population of between 50 and 500. The average spacing between two settlements along the Yamuna and Chambal was almost the
Fig. 2.4
same between 8 and 12 km.

II. First stage of Human colonization

The settlements are located on the riverbanks and in size and spacing are like the Late Harappan settlements. Only in some cases the spacing is comparatively less - between 5 and 8 km. The cultural deposit is once again shallow (0.5 to 1.5 m) indicating the short duration of settlements. The various excavations in the region show that OCP deposits at these sites were mixed with brown earth, kankar and sand, which during excavations came out in lumps. The state was quite disturbed and no sign of regular habitations was found.

III. Second Stage of Human Colonization

The second stage of colonization is represented by the painted Grey ware (PGW) and Northern Black Polished ware (NBPW). At this stage settlement extended beyond the boundaries of the first stage. Now the Settlements are found all over the region. They are also found on major rivers as well as on the tributaries. Nearly 90% of settlements are on the riverbanks.¹

During the second stage of colonization rivers played an important role in the selection of sites. The settlements in the area of inundation are on the high terraces, overlooking the river and its vast flood plain. The terraces vary in height and steepness from a

series of undulations to more or less level patches of cultivation. These patches are often inundated, providing fresh alluvial deposits rich in nutrients and are extremely good for cultivation. The evidence of flooding of OCP deposits shows that they were subjected to periodic flooding. The colonizers of the second stage seem to have learnt from this experience.

The size of settlements during this stage was sometimes as big as 8 hectares. When settlements on the tributaries reached a size of 2 to 3 hectare (400 to 600 Population) there was a tendency towards fission. The fission of settlements on the tributaries was perhaps due to the non-availability of sufficient good agricultural land in their vicinity. Further, the soils along the tributaries are not as fertile as the soils along the big rivers. This would have not only given fewer yields but also demanded longer fallow period to regain fertility. Smith (1972)\textsuperscript{1} explains that settlements of long fallow cultivation tend to be small, though the total population in the region may be large. The basic concept is that the long fallow cultivation does not so much limit the size of total population (within the limits of the environment’s carrying capacity) as limit the size of local units. The presence of large nucleated settlements on the Ganga is probably due to the greater availability of good cultivable land and shorter fallow periods.

The settlements, which are away from the rivers during this stage, are near large low-lying swampy areas, which were regular lakes in the past. On all these lakes sites of this stage have been found. The location of settlements besides them must have been due to the availability of water, aquatic food from the lakes and soft fresh alluvial soils around them. But in comparison to the riverside settlements the habitational deposit on lakeside settlement is less, showing that at the initial stages settlers might have faced disadvantages being away from the rivers and therefore perhaps deserted the site sooner.

The size of nearly 80% of the settlements remained small, having a population of less than 500. Only 20% of the settlements are big enough to accommodate a population of between 500 and 1000 or in a few cases even more. In the later phase of the colonization (600-400 B.C) three to four city sites may have accommodated 10,000 people or more. It can be safely inferred that not only the geographical area of colonization was larger during this stage but also the settlements were comparatively greater in size. The average spacing of settlements during this stage varied between 13 Km in the beginning to 6 to 8 Km in the later stage.

The lack of settlement on the Yamuna, especially

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1 Various census reports and Gazetteers of the second half of nineteenth and first half of twentieth century.
downstream of Agra, and the sparseness of settlement on Sengur can be partially explained by the presence of Kankary ravines, which extend up to 5 km away from the river banks. The soils along these rivers are most unpromising and this results in sparseness even today. Downstream from Agra only three settlement worth mentioning have been found on the Yamuna. Musanagar (Kanpur District), Reh (Fatehpur District) and Kausambi (Allahabad district). Infact, no ancient city or town was located between Agra and Kausambi, a distance is nearly 600 km, while within the same distance on the Ganga many ancient cities and towns were situated. It is important to remember that even in modern times no significant city or town has developed on the bank of Yamuna in the above mentioned stretch. Thus, it can be safely concluded that the relative unattractiveness of the Yamuna continues from ancient times.

IV. Third Stage (200 B.C. – 300 A.D.)

This stage of human colonization is represented by the early historical period archaeologically represented by Red Slipped ware. A significant change took place during this stage of colonization. The settlement extended beyond the range of location of previous settlement s. A substantial number of settlement are now found away from the rivers and lakes. The increasing pressure on the soil

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along the rivers and the lakeshores must have been one of the factor in the movement of people away from the rivers. The linear expansion of settlements has its own limitations and beyond a certain point settlements developed the momentum for circular and curvilinear growth, particularly when backed by habitable and cultivable land. In the other words, the increase of population along the river banks leads not only to the enlargement of settlements and intensive cultivation on the land around them, but also to the expansion of population in neighbouring areas. Besides, better technology in the form of increased and improved iron tools, and more organized efforts on the parts of the community and state must have helped people to open new areas for settlement.

The tendency towards the splitting of settlements along the tributaries after reaching a size of 3 to 4 hectare continued. The causes of this division must have been the same as during the earlier period. However, it must be emphasized that in general the settlement size increased, some times reaching as much as 15 hectares. The maximum number of settlement located away from the rivers and lakes are on good soils, which are well drained and can be profitably managed for agricultural purposes. The patches of usar and marsh have been avoided. One noticeable feature is that in the late period of this stage settlements also started

appearing in less hospitable areas along the Chambal indicating, that an increase in population in some areas must have forced people to colonize areas previously not very much favourable. The average spacing between two settlements during this stage of colonization was 7 to 9 km. As in the previous stage, once again settlements are more closely spaced.

At this stage of colonization cities came to be fully developed. Monumental building came into existence and burnt bricks came to be used very widely. A few cities were planned, arts and crafts increased and long distance trade flourished. In terms of political power this stage of colonization witnessed one of the biggest empires of the ancient world, i.e., the Mauryan empire.

V. **Fourth Stage (1175 – 1856 A.D.)**

The next phase in the cultural evolution of the study area started with the arrival of Muslim in eleventh century. They constructed several forts and several trade centers. Muslim particularly Mughals built several mosques at several places. Very few settlements were developed during this period, but they changed the name of old settlements.

Some of the places were administrative headquarters and a few developed as trade centers. During this period, several roads developed in the study area. It is observed that several periodic markets and fairs were developed, which gave rise to new settlements in the area. Most of the fairs were arranged in the
winter and summer seasons so that the roads and cart tracks could be used for movements of goods and people. These socio-economic conditions favoured the growth of several new settlements in the study area.

The above discussions reveals that there has been a definite pattern in the diffusions settlements during successive cultural periods. In the initial stage the settlement were confined to the tributaries. In case of the first stage the settlements are generally located on the rivers banks but a few settlements have been found away from the rivers as well. During second stage of colonization are found on the major rivers and on the tributaries as well. In this stage settlements were found in the entire region and subsequently diffuse to the sites of lakes. In the third stage intensive colonization of new areas took place. The settlements diffused from the main from sites i.e., rivers and lake to well drained and less hospitable areas in the region. It is inferred that pressure of population was realized for sustenance. During the fourth stage the some of the settlements were sprung up in the form of administrative quarters. To carry out the socio-economic need of the existing settlements, roads market fair sites and other social amenities were developed. These developments further stimulated the growth of settlements all along and near the sits in the study area.
CHAPTER III

SPATIAL ORGANIZATION OF CLAN SETTLEMENTS – A TEMPORAL ANALYSIS

1. MODELS AND THEORITICAL EXPLANATION
2. DIFFUSION OF SAMPLE CLANS AND THEIR SPATIO-TEMPORAL ANALYSIS
3. DISTRIBUTION OF CASTE AND THEIR RANKING
Geography is concerned with man and his work in space-time continuum and the study of diffusion process acting over space through time becomes the core idea of human geography. Moreover, the field of spatial diffusion analysis is closely interlinked with the process analysis and problems of spatial dynamics. In this context, two things are obvious – "firstly, any thing that moves across geographical space must be carries in some way, and secondly, the rate at which something move over space will be influenced by other things that lie in the way". These two process attributes may be called as carriers and barriers.¹ The mechanism of spatial diffusion process is a system having sequential and step process which can be traced through the proper field research and actual analysis of relevant data. Two different type of spatial diffusion may be visualized, although both might be seen together in factual situation viz (i) relocation diffusion (ii) expansion diffusion.² The former occurs when some members of the society at time t change their location from time t to t+1; the latter occurs when new members are added to the population between time t and time t+1, and expand their territory. The expansion type of diffusion is appropriate in the case of settlement growth and spread, but in the initial phase, when

original node has been developing, relocation type of diffusion can be traced out.

In geographic literature the term like 'origin and dispersal', 'origin and spread', 'pioneer settlement', 'pioneer fringe', 'Frontier concept', and 'propagation of innovation waves' etc. have been initiated, which indicate wide interests of geographers in the field of systematic study of diffusion.

1. **MODEL AND THEORITICAL EXPLANATION**

Hagerstand's model of spatial diffusion of innovation may be treated as catalyst for the present studies dealing with diffusion problems. He shows that the diffusion of innovation propagates in two dimension: the spatial and social. Considering the first dimension he suggested diffusion cycle into four phase model. First a primary stage marks the origin and establishment of initial agglomeration; second a diffusion stage marks the process with strong centrifugal effect and creation of new centre in distant

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7. Hoggarstand, T., Propagation of Innovation Waves, Lund Series (B) in Geography No. 4, (1932), pp.16-17.
areas; third, a condensing stage with an equal relative increase in all locations; and fourth a saturation stage shown by a general but slow asymptotic increase towards the maximum. Gritiches discussed innovation diffusion into three phases – origin, diffusion and saturation.\(^1\) Mitchell described the evolution of settlement in East Anglia, marks 'primary' settlement located at the river valleys and secondary settlement established on the un-occupied interfluves, the latter being an outgrowth from the former.\(^2\) Sadner deals with the process in which 'mother settlement' serve as basis for later off spring.\(^3\) This process has been occurring often in the study region and, the corporate groups (clan-based) founded new settlements by immigration from their mother nodes, due to heavy population pressure, resulting in the expansion of their territory for agriculture and defence purposes.

The most significant presentation in this context has been made by Bylund, the Swedish geographer. While considering the growth and spread of settlements in his induction model in relation to topography, economic and judicial power, he has presented colonization process into two main stages: (i) the first stage, characterized by long distance immigration of settler from outside

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the study region. (ii) short distance colonization from the initial settlements, which was sustained by genealogical studies what he has denoted as 'clone-colonization'. He further assumed that (i) the physical conditions of the land are similar in all areas and (ii) new area will not be occupied until those close to the 'parent settlements' have been occupied. He shows four hypothetical models of settlement diffusion Fig 3.1 focuses a sequence model for spatial diffusion. The fundamental differences between them is in the number and location of parent settlements. His figure D1 and D2 are applicable only for a costal type of location, while figure D3 and figure D4 for an inland location.

Hudsan also tried to give theory postulation growth, evolution and for form of rural settlement. According to his deduction theory he presented three stages of establishment and growth of rural settlement. First stage colonization, which is characterized by the dispersal into new territory, or into an unoccupied portion of the old environment; second stage spread, which is marked by the increasing population density, creation of new settlement clusters, and external pressure on the environment, both physical and social, third stage competition, which is designated as the tendency to produce great regularity in

settlement pattern and in turn produces one condition for the regular networks of central places.

Kashi N. Singh\(^1\) also presented a 'simulative structural model' showing evolution of rural territory and settlement pattern in eastern Uttar Pradesh. He has analyzed the process of spatial diffusion within the five time period: (i) the first period (generation 1 to 3) may be denoted as phase of establishment of clan centre; (ii) the second (generation 4 through 6) is characterized with the 'establishment of tappas and tappa centre', beyond the core of the area; (iii) in third period (generation 7 through 9) the existing nuclei of settlement may be established into unit of different size and (iv) during the fourth period (generation 10 through 12) new population movements take place within the occupance area founded by the families of nucleus settler, finally (v) the fifth period (generation 13 through 15) is traced out with the containing growth of population, and remaining patches and narrow strips of forest land area taken under settlement and few new 'tappas' appear in the clan territory.

Thus, by these five time period through 15 generation or about 350 to 400 years the large occupance area of the clan is appropriated for settling. As discussed above the 'Pargana' and

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BYLUND’S HYPOTHETICAL MODELS OF SETTLEMENT DIFFUSION

D1 COASTAL

D2 INLAND

D3 INLAND

D4 COASTAL

AFTER BYLUND E 1960

DIFFUSION STAGES

■ NUCLEUS
■ FIRST
■ SECOND
■ THIRD

Fig. 3.1
'Tappa' centre as well as many villages and hamlets have also come into existence on the landscape. Singh\(^1\) has also used equation in contest of the spatial frame work, considering the notion of length, time and force closely associating attributes of spatial-diffusion. By considering population \(p\), distance \(L\), and Time \(T\), the following equations may be developed:

\[
S = LT^{-1}, \text{ ie., } s = f(p, v, d) \quad \text{...... (1)}
\]

\[
P = PL^{2}T^{-2} \quad \text{...... (2)}
\]

\[
V = PL^{-1}T^{-1} \text{ i.e., } v = \frac{p}{Sd^2} \quad \text{...... (3)}
\]

According to above formula it has calculated to present the method of real situation of spatial-diffusion stages of clan settlements, depending on geological table and available record records in Bharatpur District.

**Theory**

By assuming that the costal model is not only influence by the physical factor but also by the cultural and social factors, let compare the By Lund's model \(D_1\) and \(D_4\) to the model prepared for the study region. The diffusion of Sinswar Jat clan and Sogarwal Jat clan is not only influence by physical factor but also by the cultural and social factor. There are two types of factors responsible for the coastal like diffusion: (i) Physical (river, forest,

and diara land) and (ii) cultural (clan territory and land property of the parents etc). In the study area, the social and cultural factors are quite applicable to the coastal like diffusion, but not applicable in all cases.

The clan territory of Sinsiwar clan is surrounded from three sides by the other clan territory i.e. on the north by Chaudhary Jat clan and Meos, on the west by the Sogarwal Jat clan and on the south of the Jat clan of Dhaulpur state. Owing to such limits the coastal like diffusion occurs. Similar conditions are also seen in some Rajput clan which has migrated to other place from study area. The physical factors are not applicable to coastal like diffusion because the some Rajput clan crossed the Yamuna and establish other Taluqa and Jats clan captured the whole study area.

In the case of Chaudhary Jat clan settlements the diffusion process is controlled by the physical factors and is also comparable to Bylund's diffusion model D₁ and D₄. Fig 5.2 shows that the Chaudhary Jat clan is surrounded by some small hills and some very small territories and tilas which also make the territorial boundary.

According to Bylund second assumption “the further area will not be occupied until those close to ‘mother settlement’ have been occupied. It is also quite well applicable to the study area as discussed in the sequence. Major clan settlement of first stage were
establish away from the nucleous within the territory / outside the territorial limits of the clans, while the settlements of the second and the third stage were settled in between the gaps of parent and first stage settlements. It means infilling process is applicable to the study region. The number of daughter settlements went on increasing with every advance in the process of spatial-diffusion except in the model $D_1$ where it is constant. But in the case of Meos settlements, it could be 'terminal' or saturation, which denotes asymptotic growth of settlements. Thus it quite similar to the fourth stage of Hagstrands model.

Kashi Nath Singh's simulative structural model, showing evolution of rural territorial and settlements patterns in eastern Uttar Pradesh into five period through 15 generation is quite well applicable to the diffusion of the Sinsiwar Jat clan settlements. The first period (generation 1 through 3) marks the establishment of clan centre. During the second period (generation 4 to 6) generally all patties have came into existence as is notable from 20 patties in Bharatpur tehsil. During the third period (generation 7 to 9) new settlements were establish. The fourth period (generation 10 through 12) marked the immigration as it is quite similar to the study area. The fifth period (generation 13 to 15) may be denoted with containing growth of population by capturing marginal lands. The clan territory of Bharatpur tehsil fully occupied by the foundation of new settlements as well as through immigration.
The forgoing paragraph reviews the models presented by Bylund, Hagerstrand and Kashi Nath Singh. Thereafter, the spatial-diffusion of the clan settlement has been tentatively grouped into three stages after the establishment of the oriental node: (i) first stage (before A.D. 1600) as phase of colonization (ii) second stage (between 1600-1800) the phase of diffusion (iii) third stage (since A.D. 1800) the phase of competition-cum stratification.

The three spatial-diffusion stages are quite well applicable to the case study area under study but the period is not applicable in some case. For example, in Meos clans settlement diffusion, the period are observed as (i) first stage before (AD 1300) as phase of colonization (ii) second stage (between 1300 – 1600 AD) the phase of diffusion (iii) third stage (since AD 1600) the phase of competition – cum-stratification.

**Present Approach**

The present approach has been based on following formula which depends on the detailed study of genealogical tables, historical records and the field observation. Three factors have been taken into consideration which has influenced the spatial-diffusion of the clan settlement in the study region: (i) population (p) (ii) Distance (L) and (iii) Time (T). The velocity or speed of settlements wave (s) can be express as length per unit of time (e.g. km / year) or
Further the energy of the pioneer population (P) may be defined as the speed of settlement process, the population energy may be taken as dimension.

\[ p = \frac{P}{L^2T^2} \] \hspace{1cm} (2)

But what about the way over which the people moved? In this context perhaps, the viscosity of pioneer area \( v \), can be calculated in distance in a certain length of time, possibly people per km per year or

\[ v = \frac{P}{L^3T^{-1}} \], \hspace{0.5cm} \text{i.e., } v = k \frac{P}{Sd^2} \] \hspace{1cm} (3)

In the last, the speed of settlement waves may depend on the distance \( d \), from the nucleus which has the simple dimension \( L \).

2. **DIFFUSION OF SAMPLE CLANS AND THEIR SPATIO-TEMPORAL ANALYSIS**

Here it has been assumed that at least ten families would have immigrated from outside of the study region, each family having at least ten members. There are four clan settlements which has been considered to present a detailed study of spatial-diffusion of clan settlements in the Bharatpur District.

Jat clans are the most influential clan of the eastern Rajasthan. There are different views about the origin of the Jats.
According to one view, the Jats take their name from Jata melted hair of lord Mahadeo. The Misdile the word Jat is nothing more than the modern Hindu pronunciation of Yadu or Jadu, to which Krishna belonged and which is now represented by the Jadon Rajput. According to another view, the family of Jadons, a section of Thakurs from which the ruling chief of Bharatpur claimed descent, sprang from Jad, one of the five sons of a Raja in Bengal hundreds of years ago.

The Jats are descendents of early Aryan invaders and they are predominantly found in parts of Bikaner, Jaipur and Marwar. Their presence in Bharatpur is due to more invasions.

**SINSIWAR JAT CLAN**

**Evolution**

It is pertinent to note that erstwhile rulers of Bharatpur belong to Jats Sinsiwar clan and claimed descent from Madan Pal, a Jadon Rajput and third son of Tajan Pal, who ruled in eleventh century AD at Bayana and subsequently acquired possession, which later on formed Karauli Sates. It is said that one of the Madan Pal’s descendants, Bal Chand kept a Jat women as his concubine and by her two sons, Bijay and Sijay, who were not admitted into Rajput brotherhood but regarded as Jats. They took

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the name of Sinsiwar from their paternal village, Sinsani (13 km south of Deeg). The Chief of Bharatpur traces his decent to them.¹

Spatial Diffusion

The present study is based on the morphogenetic structural analysis of Sinsini village which is founded by Jat clan, a descent of Yadu dynasty. At that time this region was forested land with babool trees under the matsya tribes. During the Mughal reign (1556-1605) introduced the new unit of administration i.e., Sarkar. Under Akbar, portion of this district comprising the Mahals of Bayana, Toda Bhim, Khanua and Dholpur fell within the Sarkar and Suba of Agra, while the Tehsil of Gopargarh, Naya Paheri and Kaman were with Jaipur state, the Sarkar of Agra contained 33 Mahals. In six Mahals, Agra, Bayana, Chou-Muha, Khawah Kothumar and Hinduan the Jats were in the position of zamindars.² After sometimes they diffused according to their need to provide suitable safety and accommodation. With the help of genealogical tables and statistical analysis it has been found that in the early 16th century the descent of Jadan Pal founder of Sinsiwar clan had migrated into three successor wave, the first branch settled in Bayana. The second branch moved towards the Deeg and third branch settled in the Bharatpur. All these

SPATIAL DIFFUSION OF SINSIWAR JAT CLAN SETTLEMENTS

Fig. 3.2A
PARENT AND DAUGHTER SETTLEMENTS
DISTANCE POPULATION RELATION

Fig. 3.2B

1. SINSINI
2. SISWARA
3. BAHAJ
4. PASTA
5. ALIPUR
6. HAYATPUR
7. NAGLA MAHARANIA
8. TANKOLI
9. KISHANPUR
10. ACHALPUR
11. AGHAPUR
12. KAPROLI
13. CHAKKURKA
14. NAGLA KALYANPUR
15. KALYANPUR
16. BIRWAJ
17. MALAH
18. SAMAI
19. KHERA BRAHMAN
20. JAROKH
21. BHAGORI
22. AJNOLI
23. PEEPLI
24. BIRHATA
25. SEWALA
26. REECHHAULI
## Sinsiwar Jat Clan

**Khan Chand**  
**Thakur Braj Raj**

- **Ati Ram**  
- **Churaman**  
- **Budh Singh**  
- **Khushal Singh**

**Bhav Singh**  
**Radha (wife)**  
She belongs to Sogar village

---

**Roop Singh**  
**Badan Singh**  
**Devika (wife)**  
Daughter of Chaudhary Akhay Rana of Kamar village

---

### Sons of Badan Singh

<table>
<thead>
<tr>
<th>Son</th>
<th>Name</th>
<th>Village</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pratap Singh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jodh Singh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Devi Singh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Med Singh (Umaid Singh)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bhawani Singh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lal Singh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Udai Singh</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Sons of Bahadur Singh

- **Suraj Mal**
  - Sons
  - **Nahar Singh**  
  - **Nawal Singh**

- **Jawahar Singh**  
  - **Ratan Singh**  
  - **Ranjeet Singh**  
  - **Kesri Singh**

<table>
<thead>
<tr>
<th>Son</th>
<th>Name</th>
<th>Village</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pratap Singh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jodh Singh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Devi Singh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Med Singh (Umaid Singh)</td>
<td></td>
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</tr>
<tr>
<td>Bhawani Singh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lal Singh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Udai Singh</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Name of holder of zamindari

1. **Rambal Thakur** known as “Chauburjawala”  
   - Pipalda, Khalka, Nagla and three village in Bayana

2. **Akhey Singh**  
   - Nam (Akheygarh)

3. **Guman Singh**  
   - Gadoli (Uchain)

4. **Surat Singh**  
   - Khera (Bayana)

5. **Jodh Singh**  
   - Bajoli (Bayana)

6. **Devi Singh**  
   - Pipli (Bayana)

7. **Med Singh**  
   - Bachhmadi

8. **Khemkaran**  
   - Extint

9. **Bhawani Singh**  
   - Sent (Kumbher)

10. **Dalet Singh**  
    - Astwan (Kumbher)

11. **Duleh Ram**  
    - Extint

12. **Ram Kishan**  
    - Mahloni (Rupbas)

13. **Kushal Singh**  
    - Aghawali (Bayana)

14. **Lal Singh**  
    - Swans and Badanpurah (Bhusawar)

15. **Balram**  
    - Ajnauali (Bayana)

16. **Vijay Singh**  
    - Extint

17. **Uday Singh**  
    - Bista (Uchain)
Table 3.1
Notion of Dimensional Attributes of Sample Village

<table>
<thead>
<tr>
<th>Stage</th>
<th>Period</th>
<th>Distance from Parent settlements (L) km</th>
<th>Population (P)</th>
<th>No. of settlement</th>
<th>Km per year</th>
<th>Population energy (P)</th>
<th>Viscosity of the land Scope (v)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Before AD 1600 (100 yr.)</td>
<td>5.25</td>
<td>5497.9</td>
<td>9</td>
<td>0.0525</td>
<td>38.939</td>
<td>9.9</td>
</tr>
<tr>
<td>II</td>
<td>Before AD 1600-1800 (200 yr.)</td>
<td>8.00</td>
<td>3722.2</td>
<td>5</td>
<td>0.04</td>
<td>38.212</td>
<td>2.326</td>
</tr>
<tr>
<td>III</td>
<td>After 1800 AD (150 yr)</td>
<td>11.525</td>
<td>2399.58</td>
<td>12</td>
<td>0.0778</td>
<td>36.607</td>
<td>1.388</td>
</tr>
</tbody>
</table>
settlement were founded – the first Stage (before 1600 AD) of clan diffusion at the mean distance of 5.25 km from the initial agglomeration.

Later on as the population of Sinsiwar village increased by natural growth it was felt essential territory so as to accommodate the large population by clearing the forest land lying at the margin of the parent village. To get maximum potential contact with minimum efforts in terms of energy, cost and to make their territory more protective, the inhabitants left their earlier sites and founded new settlements. During the second stage (between 1600-1800) of diffusion of new settlements Pipawali, Nawli, Aghanpur Jatpura established at the mean distance of 8 km from the parent settlement. Bharatpur proper was the neucleas for Jats when Suraj Mal came into power.

During the third stage (after AD 1800) of diffusion of clan settlement, mostly Jat village came into existence. To meet the needs of increasing population 15 new settlements were founded at the mean distance of 11.525 km from the original node. (Table 3.1)

Findings

Like Bylund model D1 this case also presents a three step diffusion model from the nucleus settlements. The first step is characterized by short distance immigration from parent settlement, while the second and third were characterized by long
distance immigration. It bears out the hypothesis that as the
distance increases the population energy decreases. It shows non-
availability of suitable area and productive conditions away from
the nucleus. The scatter diagram (Fig 3.2B) shows that the
distance population relation among the parent and daughter
settlements is indirectly proportional to the population. Obviously
as distance increases the population becomes low. It shows that
the lesser numbers emigrated from original node and presence of
tributaries which destroys crops and also disconnect the way to
market during rainy season. The spatial diffusion of settlements
and parent and daughter settlements are shown in Fig. 3.2A and
3.2B respectively.

SOGARWAL JAT CLAN

Evolution

According to local belief their entry into study area may be
place at approximately after the Mughals around sixteenth
century. Field enquiries suggest that this Jat clan were found from
Sirsa in Haryana. Ram Baksh Singh a ruler zamindar had entered
in Pahari Sub division and settled there. They founded Sogar
Sanwler, Satwari, Sahram and Gopalgarh villages in the sixteen
century. The name of Sogarwal is derived from their parental
village in Haryana.
Spatial diffusion of Sogarwal Jat clan settlements

Fig. 3.3A

152
PARENT AND DAUGHTER SETTLEMENTS
DISTANCE POPULATION RELATION

1. SOGRA
2. SATWANI
3. SAHSAN
4. GOPALGARH
5. SIKARPATTI
6. KAMILPUR
7. CHAKNAWLI
8. KANWAR
9. HARNAGAR
10. RUNDH KHÖH
11. IKLAHPUR
12. BARAT
13. SHYOPUR
14. SAMAI
15. KHERA BRAHMAN
16. GARHI LODHA
17. GULENA
18. SAHARAI
19. SUKHAWALI
20. SEWAR KHURD
21. KASODA
22. SADPUR
23. RUNDHESH
24. NAGLA HARCHAND
25. MAROLI
26. KANJOLI
27. SENTHARA
28. SEEDPUR

Fig. 3.3B

153
SOGARWAL JAT CLAN

RAM BHGH SINGH

Dau Singh
Hira Singh
Mangal Singh
Naranjan Singh
Chitan Singh
Arjan Singh
Baru Singh

Dhana Singh
Chajju Singh

Gumra Singh
Fatu Singh
Jaiman Singh

154
Table 3.2

Notion of dimensional attributes of Sample village.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Period</th>
<th>Distance from Parent settlement (L) km</th>
<th>Population (P)</th>
<th>No. of settlement</th>
<th>Km per Year (s)</th>
<th>Population energy (P)</th>
<th>Viscosity of land Scope (v)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Before AD 1600 (150 yr.)</td>
<td>4.83</td>
<td>4210.16</td>
<td>6</td>
<td>0.69</td>
<td>290.50</td>
<td>5.81</td>
</tr>
<tr>
<td>II</td>
<td>Before AD 1600-1800 (200 yr.)</td>
<td>5.78</td>
<td>689.30</td>
<td>23</td>
<td>0.0289</td>
<td>58.59</td>
<td>6.598</td>
</tr>
<tr>
<td>III</td>
<td>Since 1800 AD (100 yr)</td>
<td>8.50</td>
<td>2059.00</td>
<td>1</td>
<td>0.085</td>
<td>175.00</td>
<td>2.422</td>
</tr>
</tbody>
</table>
Spatial Diffusion

Dispossessed from Sirsa in some sixteen century, the Ram Baksh Singh founder of the clan immigrated at Pahari sib-division which becomes the original centre of the Sogarwal clan settlement. Ram Baksh Singh had three sons, Dan Singh, Dana Singh and Gumra Singh. The first sons family diffused and settled in Nagar sub-division while the third son Gumra Singh founded the Kaithwara and Papra villages. Gumara Singh is followed by Fatu Singh, and Fatu Singh followed by Jaimal who founded Sikarpatti and Kamilpur Patti villages. These villages were thus founded during the first stage (before AD 1600) of spatial-diffusion of clan settlements at a mean distance of 4.83 km from the nucleus.

During the second stage (between AD 1600-1800) of spatial-diffusion of clan settlements 20 pattis of Pahari sub-division and 23 village have been founded at a mean distance of 5.78 km from the original node, while in third period (Since AD 1800) only one village has been established at mean distance of 8.50 km from nucleus settlements i.e. Khohri. All these settlements were founded by Baru Singh. Fig. 3.3A and Table 3.2 shows a spatial-diffusion of Sogarwal Jat settlements.

Findings

The spatial-diffusion of Sogarwal Jat clan settlements present a general pattern that the power of model is directly
proportional to increasing distance from parent settlements, except in third stage when the power model is indirectly proportional to the distance. It shows that entire area is available but not suitable and comfortable for the growth of new settlement table 3.2 Fig 5.3A shows that as the distance from nucleus settlement increases the population thins.

The statistical results show that the velocity wave \( s \) in different stages of settlement growth has decreased, while the number of founding settlements increases with the exception of the third stage. Nearly all the settlements which were founded during the third stage are outside study region and only one of them is in area under study. This indicates saturation point. The other characteristic can be marked out that the population energy \( p \) of settler was very high during first and third stage, while in the second stage it is very low. It shows that when the number of settlements is very high, the population energy becomes less during the second stage. Thirdly, it may be noted that the viscosity of landscape \( v \) follows the same trend as population energy \( p \). In the third stage, viscosity of landscape \( v \) is as high as population energy \( p \); it shows greater productivity of the area. Fig 3.3B shows that the distance population relationship between parent and daughter settlement accentuates as the time passed, different castes and communities did not migrate from the parent village but outsiders came and occupied new settlements.
CHAUDHARY JAT CLAN

Evolution

It has been found from local views that the Chaudhary clan is a descent of Chaudhary Kashi who belong to Hodal in Mathura district. Chaudhary Ratan Singh who migrated from Mathura to Bharatpur who was allotted many zamindari by Rani Kishore who belongs to this clan. The magnificent places, built by their successors, Chaudhary Devi Singh, Daulat Singh, Ratan Singh and Hari Singh. They founded many villages and spread the adjoining villages and founded many settlements. Some village was founded by this clan i.e. Chakora, Milsawa, Bhuteli, Chatoh, Bhagwanpur etc.

Spatial Diffusion

During the first stage of spatial-diffusion (before AD 1600) of Chaudhary clan settlements only two village came into existence at a mean distance of 7 km from the nucleus while in the second stage (AD 1600-1800) of diffusion process 21 villages were founded at a mean distance of 5.66 km from the initial agglomeration, and in the third stage (Since AD 1800) of spatial-diffusion process settlements have been founded at a mean distance of 6.82 km from the parent settlements. Table 3.3 shows the dimension of spatial-diffusion of spatial attributes of Chaudhary Jat clan Settlement Fig. 5.4A also shows the spatial-diffusion of same clan.
SPATIAL DIFFUSION OF CHAUDHARY JAT CLAN SETTLEMENTS

Fig. 3.4A

159
Table 3.3

Notion of dimensional attributes of Sample village.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Period</th>
<th>Distance from Parent settlements (L) km</th>
<th>Population (P)</th>
<th>No. of settlement</th>
<th>Km per year</th>
<th>Population energy (P)</th>
<th>Viscosity of the land Scope (v)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>I</td>
<td>Before AD 1600 (70 yr.)</td>
<td>7.00</td>
<td>265.4</td>
<td>2</td>
<td>0.10</td>
<td>265.4</td>
<td>5.416</td>
</tr>
<tr>
<td>II</td>
<td>Before AD 1600-1800 (200 yr.)</td>
<td>5.662</td>
<td>899.66</td>
<td>21</td>
<td>0.0283</td>
<td>25.269</td>
<td>0.794</td>
</tr>
<tr>
<td>III</td>
<td>After 1800 AD (100 yr)</td>
<td>6.852</td>
<td>919.8</td>
<td>9</td>
<td>0.0682</td>
<td>62.776</td>
<td>1.347</td>
</tr>
</tbody>
</table>
Findings

The spatial-diffusion of Chaudhary Jat clan settlements presents a general pattern of diffusion where the power of model increases in proportion to decreasing distance from parent settlement. Table 3.3 again shows that the velocity of the settlements wave (s) followed the same trend as the population energy (p) of settlers. The first stage of spatial diffusion indicates that the immigration occurs, while the second stage shows the number of new settlements become high with low population energy, it indicates that new settlements were founded by the clans, but immigration does not occurs. Fig. 3.4B shows that the population distance among parent and daughter settlements accentuates with the passage of time, new numbers entered into the already settled villages. It shows that population and distance have positive relation, because new settlements have been founded at long distance and the people began to migrate from their parental settlement to live healthy atmosphere in the founding villages.

MEOS CLAN

The Meos is one of the important and powerful clan of the area under study who has occupied Kaman sub-division of the Bharatpur District. Believed to be formerly Hindus, estimate vary with regard to the time when their conversion to Islam took place.
SPATIAL DIFFUSION OF MEOS CLAN SETTLEMENTS

Fig. 3.5A

164
PARENT AND DAUGHTER SETTLEMENT
DISTANCE POPULATION RELATION

Fig. 3.5B
Table 3.4

Notion of dimensional attributes of Sample village.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Period</th>
<th>Distance from Parent settlements (L) km</th>
<th>Population (P)</th>
<th>No. of settlement</th>
<th>Km per year</th>
<th>Population energy (P)</th>
<th>Viscosity of the land Scope (v)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>1248.22</td>
<td>1.639</td>
</tr>
<tr>
<td>I</td>
<td>Before AD 1300 (200 yr.)</td>
<td>28.00</td>
<td>9273</td>
<td>6</td>
<td>0.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Before AD 1300-1600 (300 yr.)</td>
<td>10.20</td>
<td>11882</td>
<td>40</td>
<td>0.034</td>
<td>40.41</td>
<td>3.884</td>
</tr>
<tr>
<td>III</td>
<td>After 1600 AD (200 yr)</td>
<td>5.50</td>
<td>5020</td>
<td>1</td>
<td>3.50</td>
<td>87.75</td>
<td>7.024</td>
</tr>
</tbody>
</table>
It is believed that at the time of Timur invasion they migrated to study area from Haryana. It is the local believe that Usman Khan who migrated to study area from Haryana formerly he was a Jat ruler near Sirsa. His descendant Jahangir Khan, Barbal Khan, Khanjahan Khan established their bases in Kaman sub-division of the study area. They are also called Chaudhary who yielded great influence on the member of their community.

**Spatial Diffusion**

Table 3.4 shows the notion of dimension attributes of the settlements. In the first stage (Pre AD 1300) of the Meos clan settlements diffusion, only six villages have been founded in the adjoining area of Haryana at a mean distance of 28 km of the initial node and in the second stage (AD 1300-1600) of settlement diffusion, 40 villages have been founded at a mean distance of 10.20 km while in third stage (post AD 1600) of settlement diffusion only one village was established mean distance of 3.50 km from the present settlements. Fig. 3.5A also makes clear the stage wise diffusion of clan settlement.

**Findings**

In this case only minute changes have taken in the spatial diffusion stage due to time factors. The tabulated results of table 3.4 shows that the population (p) and viscosity of landscape (v) have positive correlation. It shows that fertile and suitable land
was establish new settlements. In the first stage of spatial-diffusion process, they have migrated at long distance and covered large area, extending into neighboring district as figure 3.5A also supports. As time passed, the population began to increase, the settlers started shifting from their original place and founded more and more villages within that parental boundary. Thus during second stage of diffusion process there has been migration at less distance, it may be denoted as infilling process. Fig. 3.5B indicates the correlation between distance among parent and daughter settlement as 50 percent of total village are located above the median line. It means at the distance increased, the population also increased. It shows that better and more productive area was available to accommodate extra population. Due to foundation of more settlement, the second stage has less population and less migration distance in relation to the first or third stage of diffusion process.

In the light of preceding discussion it can be said that hereditary principle of social organization bind the villagers in the closely integrated society whereas economic, political and ritual relations are concentrated within the boundary of their kin bodies, which make a distinct socio-cultural territorial organization.¹ It is often found that in different stages of spatial-

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¹ Singh, R.L., R.B.P. Singh D.K. "Mechanism of the Spatial-temporal diffusion of a clan settlement in a part of Middle Ganga Valley, Some
diffusion processes, the role of different phase may be structural congruencies is called isomorphism.\(^1\) The analysis of identifications and measurement of isomorphism will provide a methodology for the synthetic and relevant approach to the problem oriented in village.

In the above context the following theory may be put forwarded:

(i) The destination of migrants depends on perception of distance and choice of area according to their need and economic condition.

(ii) The 'perceptual distance' and 'need' reflect the attractiveness of each possible destination in terms of cost, problems and social control.

These two hypothesis would relate themselves with set of socio-economic and psychological factors that produce temporal sequence of migrants which is the result of varying nature of the proximities of the utilities.\(^2\)

\(^1\) Composition and correlates", in Geographical Dimension of rural settlements, R.L. Singh, (1975) Nation Geographical Society of India, Varanasi, p.32.


3. DISTRIBUTION OF CASTES AND THEIR RANKINGS

A society consists of a set of groups whose members together perform certain functions that they do not accomplish as separate groups. It may be interdependent, and the interdependence shows a particular arrangement. That is to say, that participants in each groups act in regular, anticipated ways towards members of the other groups and towards the external environment. The Indian society is highly traditional and its relevance in the present period of scientific and technological development need to examine.

Since ancient times, the caste system has decided the ranking of the social status in the religio-socio-cultural structure of the society. It is due to inter-woven religious undertone well defined society relationships and the equally well defined economic functions in a well-thought out production system. In the age of development and modernization of society, the structure of social activities, including political and economic, of the various caste is changing. Thus caste may be assign as a “network of closed, religiously-sanctified, inherent groups functioning as adoptive structure in modernization Indian Society”. Because from the begining each caste has retained it own unique features as heredity endogamous, usually localized, group, having a traditional

association with an occupation and particular position in the religio-ritual hierarchy.¹

There is, however, a need for detailed study as to how, in the study region, as in the most of rural areas of the country, the traditional village system was influenced by a territorially dominated clan which took command over a certain territory and evolved as the power elite, while other groups of the people were subordinated and become dependent on the dominant group. It is also essential to see how numerical dominance of various castes in different villages came out to be corporate political group and also to took into interrelation between these dominant and other dependent caste with mutual loyalty of kinship, ritual interdependence and other social, cultural and political ties.

The present study is systematically designed into two parts: the first provides the distributional pattern of different castes and their regionalization, while the second discuss a geographical method of caste ranking.

It is notable that census of 1931 and 1961 is last one to provide comparative caste nature on the district level and after 1931 the census division stopped to collect data on caste level, but the census of 1931 provides the data of caste distribution on Tehsil

Numerical Caste Dominancy in Bharatpur District

Different censuses between 1891 to 1931 shows the largest single caste in the study region has been the Jats follows by scheduled caste in terms of population. It has been often seen that there is sharp regionalization in these two caste. The Jats are predominant in whole Rajasthan while the schedule caste are more numerous in some pockets. In the present analysis, ten caste have been considered on the basis of their population which contribute more than one percent of the total population according to 1931 census. The comparative statistic for Tehsil of the district reveal the following features:

(i) The percentage of Jats is more than in the Bharatpur District (39%) which is the one of the highest in Rajasthan state while in other district it varies from 10 to 40%. The majority of population of Jats covers the Deeg Tehsil, Bayana Tehsil, Bharatpur Tehsil and Dholpur which is now a new district.

(ii) The scheduled caste (Chamars (Jatav) are the second largest dominant caste in the district. They consists 21% population of the total population. The highest concentration of
scheduled caste (15.14%) population is found in Rupbas tehsil followed by 15.04% in Weir Tehsil and in Deeg Tehsil it is consist 12.31% of the total population.

(iii) The Brahmins are ranked third in caste hierarchy of the district. Numerous in Dholpur sub-division, the Brahmins are spread all over the district, because in the Hindu social system they perform many religious rites. In Dholpur and Rajkhera sub-division the Brahmins are dominant castes and they consist 12% of the total population of the district, but becoming new District of Dholpur, the percentage became low in the Bharatpur District.

(iv) The Gujars are the fourth largest caste in the district. Gujjars are agriculturists and found all parts of the district. The Gujars are considered Kshatriyas below the Jats in the social hierarchy. They consist 8% of the total population of the district.

(v) The Mahajans are fifth largest caste in the district. Most of the Mahajans are in the district are Jains and their principal division are Saravgi, Agarwal, Khendelwal, Vijayavargi, Maheshwari, Powal and Paliwal. The number of Agvarwal is large. Khandelwal Mahajans originally came from Khandelwal village in Sikar district. The people of this caste are Jains. Vijayawargis also came from Kandela village and
are mostly Jain businessman. They consists about 7% of the total population of the district.

(vi) Meos are the sixth largest caste far as population is concerned. They are dominant in Kaman and Bayana Tehsil of the district. They are Muslims believed to be formerly Hindus, estimated very regard to the time when their conversion to Islam took place. They consist 4 percent of the total population by the district.

(vii) Kolis is an important caste of the district. Their traditional occupation is weaving. Most of them also good masons. They are found in Bharatpur Tehsil and Rupbas Tehsil of the district. They consist of 2 percent total of population of the district.

(viii) The Nai is an important caste, for besides being barbers; they are traditional match makers. The percent of Nai is essential on almost all the ceremonial functions and occasions, particularly at the time of marriage when they cut the hair of baratis (members of marriage party), bathe the grooms, supply pattal and dona (leaves plates and bowls) and also work as groomsman. For the service rendered, they are paid both cash and kind. Their percentage of population is very small.

(ix) The other occupational caste in Lohar (carpenter or block smiths). They are found in very small quantity as far as their
population is concerned. They are consists only one percent of the total population of district.

(\textit{x}) The tenth important caste is Sonars (Gold smithis). They are engaged in making of gold items of Jewellery which is very important ornament in the marriage ceremony. They consist only one percent of the total population of the district.

\textbf{Population Variation of Selected Castes (1891-1931)}

Fig. 3.6 shows the population variation of some selected of the study area during 1891 to 1931 on Tehsil level. It has been analyzed, the Meos, Gujars, Mahajans and Kolis have indicated less variation of population between 1891 to 1931 while the net population of Brahman has decreased about 3 percent. The population of Jats and Chamars (Jatav) has increase.

\textbf{Caste Region}

The district has been marked out by the numerical predominance by the Jats but there are remarkable difference on Tehsil level taken as basis for the caste regionalization in the area under study. The three region can be marked, viz., the Jats the Chamars (Jatav) and Brahmans. A detailed breakup of the caste region is as follows:

\textbf{The Jats dominated region:}

The Jats are dominant over Deeg, Bayana, Bharatpur, Sewar tehsils. In these tehsils the percentage various from 30 to 40% of
DECADE POPULATION VARIATION

Fig. 3.6

177
the total population of the district. All these place the Jats are dominated in land holdings as well as social and caste hierarchy.

**The Chamars (Jatav) Dominated Region**

Through the Chamars have been traditionally leather workers, they are mostly engaged in and or as agriculturer laborer. They mostly belong to landless Clan. Most of the land which chamars cultivate is a part of return for working for the land owing community. They are mostly concentrated in Nadbai, Rupbas and Weir tehsils. The Chamars account for a total of 12% in the district population.

**The Brahmins Dominated Region**

The population concentration of the Brahmans is high in Dholpur-sub-division which is now a new district separated from the Bharatpur District. But they are spread all over the district because in the Hindu social system, they performs many religions rites. Traditionally, Brahmans are priest in temples. They are 200 big temples in the district and each of them has a pujari-worshippers. Formerly Pujari got assistance from the state government in the form of cast or rent for agriculture land.

**Caste Ranking**

The secular power derived from education, politicalization, economic position, etc., shows much deviation in the numerical
concentration pattern. At the village level, the land is the most effective parameter which decides the position of the caste in the caste hierarchy.

The cast ranking may be defined as "the body of collective opinion concerning the placement of ethnic groups as corporate wholes higher or lower than one another in precedence or esteem". Cast ranking in collective community denotes the sentiments of different caste, while 'each and every human being inhabits its own subjective world, which is a function of its perceptual apparatus' and as the society develops it will be controlled by an objective world of perception, the latter is more suitable in modern India. It may be accepted that man of any community, group of culture "now he is in position of creating his own biotope. He is therefore, in position of determining what kind of organism he will be". Many scholars have considered 'caste ranking' only a part of social system but it should be considered as a part of dominance, in term of economic power, landownership, number, etc which makes rural society very complex. Anthropologist have mostly considered the single religio-ritual norms for caste ranking instead of correlative identification, while in the centre of village, the resources, and political and economic factors are the most important so the different component of

secular power\textsuperscript{1} (e.g., economic status, numerical strength) must also be taken into consideration for caste ranking.

Marriot\textsuperscript{2} made an attempt to classify the caste ranking into two parts i.e., attributional and interactional; while in attributional theory he considers only population pressure and landownership by caste, but the presumed hierarchy of values in matters of diet, occupational etc does not correlate well with the observed order of caste ranking and how the different norms of attributes will be compared with each other or combined in one hierarchy of values. Dubey\textsuperscript{3} considers "hierarchy of foods and occupations also materially contributes to the social ranking of caste", but it is ritual, not economic and former principle of caste ranking does not interpret all respect of Hindu society. While Gough\textsuperscript{4} consider in her study of caste ranking in South India the bases of judicial levels of different castes in ritual hierarchy. She has also accepted the role of different attributes, e.g., economic etc., which are the prime determinants of their ritual describe by her, "Neither in present nor in the past can the ritual ranking of castes be understood reference to the political and economic system in which they are embedded".

\textsuperscript{1} Daris K., W.R. Noore, "Some principles Stratifications" American Social Law, 10 (1955), pp.242-249.
Singh\(^1\) also throws some light on interactional theory and he adopted to rank an individual cast in term of correlation ratio between two resource oriented attributes – population size and landownership. He has introduced a theory termed as correlative Geo-economic Attributional Theory of Caste Ranking. An attempt is made to test how for this proposed theory fits in the study region.

**Correlative Geo-Economic Attributional Theory**

It is well known fact that those who control the territory-resources, lead the society also mentioned by Mandelbaum that “local power flows mainly from the land, land is the prime goods in this agrarian setting, land is the main source of wealth; land is the main need for a Jati on rise\(^2\). Of all of the villages values, the most important and permanent source in not money, but land is the primary, scarce productive resource, control of land means control of livelihood\(^2\).

Generally it is found that land owning castes have been controlling more resources and higher status than the landless caste as often seen in real situation. The most important component i.e., numerical strength and economic power, which control the village society at different level as discuss by Srinivas that, ‘the caste is dominant when it is numerically strongest in the

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village or local area and economically and politically exercise a propounding influence.¹

The proposed theory is fundamentally based on the correlative weight of two geographical attributes i.e., population and landownership, which may be termed as correlative Geo-economic Attributional theory of caste ranking.² The present theory may be applied for ‘system analysis’ which have been types of components, first spatial structure component and second interactional components, jointly constitute Geo-spatial systems.³ In the present analysis only former components has been taken into consideration.

Testing of Theory

Three villages have been taken into consideration from the area to test the theory on micro level. For such purpose total arable land has been considered. The Jats are dominant caste in the both sense i.e., in terms of landownership as well as in terms of population among three villages. The other dominant castes are Brahmans Gujars Gujjars, Mahajan and Meos. Three villages are Sinsini, Aghapur and Adhawali.

Fig. 3.7
VILLAGE ADHAWALI
1991

Fig. 3.7

1. JAT
2. BRAHMIN
3. GUJAR
4. MAHAJAN
5. MELO
6. KOLI
7. KUMHAR
8. NAII
9. CHAMAR

100
10
1
0.1
0.01

LAND OWNERSHIP IN %

100
10
1
0.1
0.01

POPULATION IN %

184
Sinsini

It is situated 13 km, South of Deeg Tehsil. It is dominated by the Sinsiwar Jats who constitute about 40% of total population. The village was founded by forefather of Sinsiwar Jat during the sixteenth century. Before the Jats it was dominated by Mastya tribe in ancient days. In the Mughal period it was under Agra Sarkar. The Sinsiwar Jat took the name from this village Sinsini. The Jat still enjoy their dominancy in number as well as in landownership. They have controlled 70 percent of landed property. The Jats followed by Brahmins who control about 20 percent of land and 17% of total population. The Gujars and Chamars (Jatav) rank third and fourth respectively according to their numerical strength. It was observed that about nine caste have some land property while rest caste have little land holding.

Aghapur

Aghapur is located on the slopes of a hillock known as the khera. It is bounded north by village Kanjaron ka bas, on the east village Darapur, on the west by village Kaproli and on nthe south by Ghana forest. It is ten km away from the Bharatpur city. The Jat founded this village, who still enjoy dominance by controlling the land as well as number of people. They posses about 80 percent of total land with a population of 19 percent. According to landownership the Jats, Gujar, Brahman, Banjara, Sikh, Kumhar,
Nai, Lodha, Chamar, got first, second third, fourth, fifth, sixth, seventh, eighth, ninth respectively.

**Adhawali**

It is situated 15 km west of Deeg. It is very old village and founded by Chaudhary Jat clan. The forefather of this clan Chaudhary Ratan who migrated from Mathura to this study area who allotted many zamindari by Rani Kishori who belong to this clan. The Jats are dominant caste in this village who constitute about 47 percent of the total population with 93 percent of landownership, enjoy first rank, while the Brahman comes next in term of population (11 percent). The third rank is attributed to Gujars, the fourth to Mahajan and fifth to Meos, Sixth to Kolis seventh to Kumher, eighth to Nai, ninth to Chamar (Jatav). The landownership comes under same order.

From the detailed discussion it is clear that Jats are dominant caste followed by Brahmins, Gujars, meos and others. The Brahmin in spite of first rank in caste hierarchy of the orthodox social scale is not influence due to less share in landownership and dependence on the land owing communities. It may also be concluded that the Chamars (Jatav) are depressed caste due to lack of landholding, while they dominant in number almost all villages taken into consideration for this study. But it is observed that Chamars (Jatav) are getting higher status by
securing of job opportunities in central/state government services.

Now they are purchasing land by land owing caste and it is hoped that in near future they would be a land owing caste.
CHAPTER IV

SPATIAL DISTRIBUTION OF RURAL SETTLEMENTS

1. GENERAL DISTRIBUTION AND SITTING OF RURAL SETTLEMENTS
2. SIZE OF SETTLEMENTS
3. SPATIAL ANALYSIS
4. DISPERSION ANALYSIS
5. TYPE OF RURAL SETTLEMENTS
6. FACTORS AFFECTING THE RURAL SETTLEMENTS
The spatial distribution of any phenomenon on the earth evolves some pattern whose study in the main area of the interest for the geographers, particularly in the case of rural settlement such analysis becomes more meaningful as it is not only helps in identify the present spatial pattern but also suggest ways and means for its better planning and development. In the beginning the forest were cleared and the land made available for agriculture. And with the passage of time, not only the needs increased but also become more complex. In the earlier days when man started cultivating the land and made settlements to live, independent resulted in the establishment of closer settlements. Thus the smaller and isolated hamlets of early days were replaced by closer and compact habitats. Now a days a settlement is defined as a group of houses in which people live, work and stock or use them otherwise, and the track or street over which their movements takes place.¹ Such human dwellings include homestead, hamlets, village, town and city of varying and size and may range from an isolated habitation to a large agglomeration. Thus spatial study of settlements shows the relationship between the resources of a region and its people because settlement distribution is nothing

but a frequency in which they occur in a given space.¹ The frequency is high when the resources are in plenty and easily available for exploitation and utilization. Thus, settlements distribution is an index of resources distribution of a region and its utilization by the people.²

Here the focus attentions are on the distribution, size, type, spacing and regularity of rural settlements in the district for the present study the Panchayat Samiti and tehsil are taken as well as the unit of area and quantitative technique has been used for spatial analysis.

1 GENERAL DISTRIBUTION AND SITTING OF RURAL SETTLEMENT

The region having homogenous relief and fertile soils, has an almost uniform distribution of rural settlements. However, slight variation may be seen at micro level due to differences in local relief, source of water supply, drainage lines, soil type, pattern of land use, transport accessibility, social attribute and population density.

The rivers of the district Banganga, Gambheer and Ruparel have played a crucial role in the selection of sites for human habitation in pre-historic time. Many places in this area have been

proved to be oldest sites of human habitation dating back to around 1500 B.C. as revealed by recent archaeological excavation. The historical evidence is available in form of a number of relics features belonging to Buddhists, Meos, Rajputs, Jats who establish their colonies in these areas.

Flat land plays a Pivotal role in pattern the settlements distribution of the district. Since most valuable resources of the district is the fertile soil deposited by rivers and tributaries, there were ample opportunities for the people to settle in the area under study. As a result, the area underwent dense population. Other factors governing the spatial distribution of rural settlement in the district included safety from flood, suitable flow system (canal) for irrigation etc. Beside the settlement distribution of the study area is related various socio-economic condition. Market (weekly / permanent), industry, education institution, hospital etc. are other important factor influencing the settlement pattern. The spread of new means of Communication and transportation is also exercising an influence on the settling and distribution of small settlements but recently developed market, roads, tracks and Communication lines have made very little on general distributional pattern of settlements, except for the growth of a few hamlets arising out of the main village to avoid congestion or to respond to new socio-economic situation, Sirond, Chokarwara.
Kalan, Salempur Khurd, Ucchain etc. villages along the roads are example.

The district having some hilly track in Bayana and Rupbas, there is sparse human inhabitation. It covers the southern part of the district. On the other hand the rest area is almost plain and fertile soil so in the region the settlements is more compact them hilly part of the area.

Tank sites settlements are common in Bayana Tehsil and some tanks are found near Bharatpur. Motijheel, Keola Deo Jheel, Madal Jheel, Jheel ka Bara are the important lakes of the district. The tanks and lakes in the region together with various patches of infertile usar lands have made their impact on the distributional pattern of settlement in this area.

2. SIZE OF SETTLEMENT

The size (area and population) and density of settlements is closely relating to spacing, with an increase in distance between settlement, the density of settlement tend to decrease.\(^1\) In Bharatpur District the average areal size of villages is 3.560 km\(^2\) but it is less than all India average (5.02 km\(^2\)).

The table 4.1 clearing indicates that highest per village areal coverage (4.942 km\(^2\)) in Bayana Panchayat Samiti while lowest areal size of village 2.809 km\(^2\) in Nagar Pahari Panchayat Samiti.

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Weir and Nadbai have large areal size of village i.e. 4.002 \( \text{km}^2 \) and 3.772 \( \text{km}^2 \) respectively. Fig. 4.1 shows areal size of village in district per sq km at Panchayat Samiti level.

**Table 4.1**

**Distribution of Area Average per village Sq. km. At Panchayat Level (1991)**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Panchayat Samiti</th>
<th>Area Sq. km</th>
<th>No. of Settlements</th>
<th>Average Village Km(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kaman</td>
<td>535.2</td>
<td>187</td>
<td>2.862</td>
</tr>
<tr>
<td>2</td>
<td>Nagar Pahari</td>
<td>609.7</td>
<td>217</td>
<td>2.809</td>
</tr>
<tr>
<td>3</td>
<td>Deeg</td>
<td>465.2</td>
<td>120</td>
<td>3.876</td>
</tr>
<tr>
<td>4</td>
<td>Kumher</td>
<td>433.3</td>
<td>111</td>
<td>3.903</td>
</tr>
<tr>
<td>5</td>
<td>Sewar</td>
<td>438.2</td>
<td>154</td>
<td>2.845</td>
</tr>
<tr>
<td>6</td>
<td>Nadbai</td>
<td>430.1</td>
<td>114</td>
<td>3.772</td>
</tr>
<tr>
<td>7</td>
<td>Weir</td>
<td>568.3</td>
<td>142</td>
<td>4.002</td>
</tr>
<tr>
<td>8</td>
<td>Bayana</td>
<td>785.9</td>
<td>159</td>
<td>4.942</td>
</tr>
<tr>
<td>9</td>
<td>Rupbas</td>
<td>523.3</td>
<td>141</td>
<td>3.711</td>
</tr>
<tr>
<td></td>
<td>District Bharatpur</td>
<td>4789.2</td>
<td>1345</td>
<td>3.560</td>
</tr>
</tbody>
</table>

**Source:** Compiled from District primary Census Hand Book (1991), village and Town Directory of Bharatpur District Rajasthan.
BHARATPUR DISTRICT
SIZE OF VILLAGES
(Based on area)
1991

Fig. 4.1
Table 4.2

Distribution of Population (Average village size) At Panchayat Samiti Level (1991)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Panchayat Samiti</th>
<th>Population</th>
<th>No. of Settlements</th>
<th>Average Village population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kaman</td>
<td>154287</td>
<td>187</td>
<td>825.06</td>
</tr>
<tr>
<td>2</td>
<td>Nagar Pahari</td>
<td>181672</td>
<td>217</td>
<td>837.19</td>
</tr>
<tr>
<td>3</td>
<td>Deeg</td>
<td>125627</td>
<td>120</td>
<td>1046.89</td>
</tr>
<tr>
<td>4</td>
<td>Kumher</td>
<td>129059</td>
<td>111</td>
<td>1162.69</td>
</tr>
<tr>
<td>5</td>
<td>Sewar</td>
<td>133563</td>
<td>154</td>
<td>867.29</td>
</tr>
<tr>
<td>6</td>
<td>Nadbai</td>
<td>127668</td>
<td>114</td>
<td>1119.89</td>
</tr>
<tr>
<td>7</td>
<td>Weir</td>
<td>160526</td>
<td>142</td>
<td>1130.46</td>
</tr>
<tr>
<td>8</td>
<td>Bayana</td>
<td>151810</td>
<td>159</td>
<td>954.77</td>
</tr>
<tr>
<td>9</td>
<td>Rupbas</td>
<td>166569</td>
<td>141</td>
<td>1181.34</td>
</tr>
<tr>
<td></td>
<td>District Bharatpur</td>
<td>1330781</td>
<td>1345</td>
<td>989.4</td>
</tr>
</tbody>
</table>

BHARATPUR DISTRICT
SIZE OF VILLAGES
(Based on Population)
1991

Fig. 4.2
Table 4.3

Classification of villages by Population Ranges (1991)

<table>
<thead>
<tr>
<th>Range of population</th>
<th>Number of villages in each range</th>
<th>Percentage of village in each range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 200</td>
<td>136</td>
<td>10.11</td>
</tr>
<tr>
<td>200-499</td>
<td>335</td>
<td>24.90</td>
</tr>
<tr>
<td>500-1999</td>
<td>732</td>
<td>54.42</td>
</tr>
<tr>
<td>2000-4999</td>
<td>131</td>
<td>9.73</td>
</tr>
<tr>
<td>5000-9999</td>
<td>11</td>
<td>0.81</td>
</tr>
<tr>
<td>Total</td>
<td>1345</td>
<td>99.97</td>
</tr>
</tbody>
</table>

Source: District Primary Census Handbook (1991)
The average population of a village in the study area is 898 persons. The table 4.2 shows that in Rupbas Panchayat Samiti the average village population is highest among all the Panchayat Samiti i.e. 1181 persons. The lowest average population of villages is Kaman Panchayat Samiti i.e. 825 persons. Kumher and Weir Panchayat Samiti also have higher average population i.e. 1162
and 1130 persons respectively. Nagar Pahari and Sewar Panchayat Samiti ranks in lower categories i.e. 837 and 867 persons respectively. Fig. 3.2 shows the average population of village at Panchayat Samiti level Table 4.3 shows that only 0.80% of village of the district have population of above 5000 persons. The village having population between 500-1999 occupy the 54.42% area of the district. The village having population less than 200 persons occupy the 10.11% area of the district. And the village having population between 200-499 persons occupy the 24.90% of the total area of the district. The village having population between 2000-4999 persons occupy the 9.73% area of the district.

The classification of village of the district based on size of population has been taken into consideration while studying the spatial distribution of rural settlements. The village have been divided into six population group. The table 4.3 indicates that population having above 5000 persons is least, it means that big village is less in study area while population having 500-1999 is highest i.e. 732 villages. It is clear from the table that there is uneven distribution of population of villages between different categories and between different Panchayat Samiti of the district. Fig. 4.3 displays the distribution of population size of village at Panchayat Samiti level. The average settlements density of the district is 28.277 settlements / 100km². The table 4.4 indicates that the highest density is found in Rupbas Panchayat Samiti i.e.
31.8 settlement per 100 km$^2$ and followed by Sewar (30.4) Kumher (29.7), Kaman (28.8), while the lowest density is 19.3 settlement/100km$^2$ is Bayana Panchayat Samiti. The settlement density per 100 km$^2$ i.e. 19 to 32 varies from one place to other in the study area. Fig 4.4 shows that the density of settlements per 100 sq. km.

3. **SPATIAL ANALYSIS**

The spacing of rural settlements denoted the locational arrangements of village with respect to one another. To analyze this dimension, classical geographers have considered spacing as a basic for the rural settlements into different types. In Sweden, Switzerland, Poland and France, geographers have used fixed spacing as a unit for the measurement of concentration and dispersion. However, no statistical tool provides a perfect various of distributional pattern because every unit has its own trend and identity as regards socio-cultural and spatial characteristics$^1$. So none of these methodological can have universal application the theoretical basis of the relationship between settlement density and spacing. It was first provide by Robinson and Barnes for the analysis of dispersed rural population of Midwest USA and Ontorio.$^2$ Their formula is based on the concept of uniform

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distribution formally devised by Christaller. This was first modified by Mather¹ in the following manner:

\[ D = 1.0746 \]

Where \( D \) denotes the theoretical distance between points or settlements in hexagonal arrangement

\[ A = \text{area} \]

\[ N = \text{denotes the Number of settlements per unit area} \]

**Table 4.5**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Panchayat Samiti</th>
<th>Area Sq. Km</th>
<th>No. of Settlements</th>
<th>D Inter Village spacing (in km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kaman</td>
<td>535.2</td>
<td>187</td>
<td>1.817</td>
</tr>
<tr>
<td>2</td>
<td>Nagar Pahari</td>
<td>609.7</td>
<td>217</td>
<td>1.801</td>
</tr>
<tr>
<td>3</td>
<td>Deeg</td>
<td>465.2</td>
<td>120</td>
<td>2.115</td>
</tr>
<tr>
<td>4</td>
<td>Kumher</td>
<td>433.3</td>
<td>111</td>
<td>2.123</td>
</tr>
<tr>
<td>5</td>
<td>Sewar</td>
<td>438.2</td>
<td>154</td>
<td>1.812</td>
</tr>
<tr>
<td>6</td>
<td>Nadbai</td>
<td>430.1</td>
<td>114</td>
<td>2.087</td>
</tr>
<tr>
<td>7</td>
<td>Weir</td>
<td>568.3</td>
<td>142</td>
<td>2.149</td>
</tr>
<tr>
<td>8</td>
<td>Bayana</td>
<td>785.9</td>
<td>159</td>
<td>2.223</td>
</tr>
<tr>
<td>9</td>
<td>Rupbas</td>
<td>523.3</td>
<td>141</td>
<td>2.070</td>
</tr>
</tbody>
</table>

The computation of theoretical inter settlements distance at Panchayat Samiti level clearly indicates the pattern of spacing of the district, which according the range of spacing various between 1.801 km to 2.223 km. on the basis of this village spacing can be

---

BHARATPUR DISTRICT
SPACING OF VILLAGES

KILOMETRE

> 2.20
2.10 – 2.20
2.00 – 2.10
< 2.00

--- State Boundary
--- District Boundary

Fig. 4.5

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grouped into law, moderate, high, very high spacing. The Table 4.5 and Fig 3.5 shows the inter village spacing at Panchayat Samiti level.

**Low Spacing (< 2.00 km)**

This group consists of three Panchayat Samiti i.e. Kaman, Nagar Pahari, Sewar. These cover about 33% area of the total area of the district. The average density of villages are Kaman (28.6 village/100km²), Nagar Pahari (28 village/100km²), Sewar (28.4 village/100km²). The development of transport and Communication irrigation facilities and fertile soil responsible for the growth of semi compact settlements in these area.

**Moderate Spacing (2.00 – 2.10 km)**

This group comprises two Panchayat Samiti i.e. Rupbas and Nadbai. These covers about 19 % of the total area. The average village density is (30.2 village / 100km²), (37.1 village / 100km²) of Badbai and Rupbas respectively.

**High Spacing (2.10 – 2.20 km)**

This group consists of three Panchayat Samiti i.e. Deeg, Kumher and Weir. It covers the 30% of total area of the district. The average density of village are Deeg (30.8 village / 100km²), Weir (40 village / 100km²). Kumher (39 village / 100km²).

**Very High Spacing (above 2.20 km)**
This comprises one Panchayat Samiti i.e. Bayana. It covers the area of 16040% of total area of the district. Its average density is 49 village / 100km².

The foregoing discussion reveals a direct relationship between spacing and settlement size in the different Panchayat Samiti of Bharatpur District. It is obvious that where spacing is high, villages are of large size, with small number of hamlets having higher densities of population, which results in compact structure of settlements. On the contrary in area of low spacing, settlements are generally smaller size with low pressure of population and scattered distribution pattern viz, hamleted type settlements.

4. DISPERSION ANALYSIS

Though the agrarian setup, land tenure and human influence have played a major role in modification and transformation of habitat system, yet the forces determining the present rural settlements patters, have been mainly related to physical character of the terrain with their direct and indirect influence various statistical methods have been used to measure the nature of distributional pattern of human settlement. An attempt has been made here to measure the degree of dispersion taking base of observed of nearest inter-village straight line distance, the method being termed as nearest neighbour distance approximation analysis. It is assumed that points are distributed
randomly in accordance with a Poisson probability function, where it is supposed that each location has an equal chance of containing a point, while in the real world settlements are not always evenly spaced, nor on the other hand they are spaced in strictly random pattern.¹ Thus, it may be defined as the degree of deviation at a set point from random to some delimited area.²

The first approach towards dispersion analysis was initiated by Clark and Evans in their analysis of the distributional pattern of various species over a given space. Later Decay followed this approach and tested it in geographical context and able to enlarge the family of probability density function describing point and central place pattern. The method is known as nearest neighbour analysis which denotes the ratio of actual mean of their nearest settlement distance \((r^0)\) to expected distance \((r^E)\).

\[
R_n = \frac{r^0}{r^E} \quad \text{where}
\]

\[
r^E = \sqrt{\frac{d}{y_2}} \quad \text{where}
\]

\(d\) = denotes the settlements density also written as

\[
R_n = 2r^0\sqrt{d}
\]

For the present analysis Tehsil has been taken as the standard areal unit for measurement of \(R_n\) values and all the

inhabited settlement in the different tehsil of Bharatpur District have been taken into consideration in the present study. The index of randomness ($R_n$) has been calculated by applying the above mentioned formula. This provides a measure of the degree to which the distributional pattern of the observed inter village distance deviated from random exception. The value of this index ranges from 0.0 (complete concentration) through 1-0 (random) to 2.149 (ideal or normative hexagonal lattice).

Table 4.6

<table>
<thead>
<tr>
<th>S.No</th>
<th>Tehsil</th>
<th>$d$/km$^2$</th>
<th>$D$</th>
<th>$r^0$</th>
<th>$r^E$</th>
<th>$R_n$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kaman</td>
<td>0.371</td>
<td>1.817</td>
<td>1.693</td>
<td>1.347</td>
<td>1.256</td>
</tr>
<tr>
<td>2</td>
<td>Pahari</td>
<td>0.372</td>
<td>1.810</td>
<td>1.810</td>
<td>1.344</td>
<td>1.346</td>
</tr>
<tr>
<td>3</td>
<td>Nagar</td>
<td>0.372</td>
<td>1.105</td>
<td>1.105</td>
<td>1.337</td>
<td>0.826</td>
</tr>
<tr>
<td>4</td>
<td>Deeg</td>
<td>0.343</td>
<td>1.262</td>
<td>1.262</td>
<td>1.458</td>
<td>0.865</td>
</tr>
<tr>
<td>5</td>
<td>Kumher</td>
<td>0.343</td>
<td>1.373</td>
<td>1.373</td>
<td>1.459</td>
<td>0.941</td>
</tr>
<tr>
<td>6</td>
<td>Nadhai</td>
<td>0.346</td>
<td>1.362</td>
<td>1.362</td>
<td>1.445</td>
<td>0.942</td>
</tr>
<tr>
<td>7</td>
<td>Bharatpur</td>
<td>0.371</td>
<td>1.047</td>
<td>1.047</td>
<td>1.349</td>
<td>0.776</td>
</tr>
<tr>
<td>8</td>
<td>Weir</td>
<td>0.341</td>
<td>1.032</td>
<td>1.032</td>
<td>1.467</td>
<td>0.703</td>
</tr>
<tr>
<td>9</td>
<td>Bayana</td>
<td>0.335</td>
<td>1.047</td>
<td>1.047</td>
<td>1.493</td>
<td>0.701</td>
</tr>
<tr>
<td>10</td>
<td>Rupbas</td>
<td>0.347</td>
<td>1.099</td>
<td>1.099</td>
<td>1.442</td>
<td>0.762</td>
</tr>
</tbody>
</table>

The table 4.6 shows the result of the $R_n$ values and different indices calculated with reference to the nearest neighbour analysis of each tehsil of the district. The $R_n$ value ranging from 0.701
BHARATPUR DISTRICT
NATURE OF DISPERSION OF RURAL SETTLEMENTS

Fig. 4.6

RN VALUES

\[
\begin{align*}
\text{\textless .800} & \\
.801 \text{-.900} & \\
.901 \text{-.1.00} & \\
> 1.00 & 
\end{align*}
\]

--- State Boundary
--- District Boundary

5 0 5 10 15KM

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Bayana) to 1.346 (Pahari) tehsils reveals a clear tendency towards regularity. Fig 4.6 shows the nature of dispersion of rural settlement in study area.

On the basis of $R_n$ values, dispersion in different tehsil of the district may be classified under four categories.

**Low Regularity (0.700 - 0.800)**

This group includes from tehsils i.e. Bayana (0.701), Weir, Rupbas (0.762), Bharatpur (0.776). It covers the 38% of the total area of the district. The area is inhabited by high to medium size village (being 3.50 to 4.50 km$^2$ average area of the village).

The expected inter-village distance ($r^E$) and Bayana (1.493), Weir (1.467), Bharatpur (1.349), Rupbas (1.442). The observed inter-village distance ($r^o$) are Bayana (1.047), Weir (1.032), Bharatpur (1.047), Rupbas (1.099). The village are big in southern part of the district. The village intensity is high in Bayana and Weir.

2. **Moderate Regularity (0.801 - 0.900)**

Moderate regularity comprises Nagar and Deeg tehsil of Bharatpur District. The $R_n$ value are 0.826 and 0.865 of Nagar and Deeg respectively. It covers about 13% area of the whole district. The density of village in these tehsils per 100 km$^2$ ranges from 27 to 30. The observed inter-village of these tehsils are Nagar (1.105) and Deeg (1.262). the expected inter-village distance $r^E$ is 1.337 and 1.458 of Nagar and Deeg respectively.
Bharatpur District
Nearest Neighbour Distance
of Rural Settlements
1991

Fig. 4.7

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3. **High Moderate Regularity (0.901 – 1.00)**

Moderate high regularity has been found in two tehsils in the district i.e. Kumher and Nadbai. They together covers the area of 18% of the whole district. The observed inter-village ($r^o$) of Kumher and Nadbai are 1.337 and 1.362 respectively. The expected inter-village distance ($r^e$) of Kumher and Nadbai 1.459 and 1.445 respectively.

4. **High Regularity (1.00 and above)**

High regularity has been found in two tehsil of Bharatpur District i.e. Kaman and Pahari tehsil. The observed inter-village ($r^o$) distance of Kaman and Pahari are 1.693 and 1.810 respectively. The expected inter-village distance ($r^e$) and 1.347 and 1.344 of Kaman and Pahari respectively.

The expansion analysis shows that the trend of dispersion has in every case been found towards regularity.

5. **TYPES OF RURAL SETTLEMENTS**

The word ‘type’ used here indicates the relationship between settlement within organized space, which provides a distinctive view of the spatial organization. The type of settlement vary according to environmental factors, important being lay-out of the land and its location, the arrangements of social stratification, stages of economic development and so on. The present classification of settlement is based on the pattern of nucleation of occupance unit in a given space, which is an outcome of different
physico-cultural factors. The settlements are classified into three types according to the spatial arrangements of the house i.e. hamleted type according to the spatial arrangements of the house i.e., hamleted, semi compact, compact. The compact settlements shows very close spatial organization of the house while hamleted indicate scattering of occupance unit along the, loose spatial structure. In this way, every settlement has its own distinct and unique personality.

Table 4.7
Population of Villages and Percentage of each ranges in Brackets

<table>
<thead>
<tr>
<th>No.</th>
<th>Tehsil</th>
<th>Total village</th>
<th>Less than 200</th>
<th>200-499</th>
<th>500-1999</th>
<th>2000-4999</th>
<th>5000-9999</th>
<th>Above 10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dist. Bharatpur</td>
<td>1345 (100.00)</td>
<td>136 (10.11)</td>
<td>335 (24.91)</td>
<td>732 (54.42)</td>
<td>131 (9.74)</td>
<td>11 (0.82)</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Nagar Pahari</td>
<td>217 (100.00)</td>
<td>22 (10.14)</td>
<td>67 (30.88)</td>
<td>114 (52.53)</td>
<td>13 (5.99)</td>
<td>1 (0.46)</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>Kaman</td>
<td>187 (100.00)</td>
<td>21 (11.23)</td>
<td>64 (34.22)</td>
<td>89 (47.59)</td>
<td>12 (6.42)</td>
<td>1 (0.54)</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Ducch</td>
<td>120 (100.00)</td>
<td>15 (12.50)</td>
<td>30 (25.00)</td>
<td>61 (50.83)</td>
<td>12 (10.00)</td>
<td>2 (1.67)</td>
<td>--</td>
</tr>
<tr>
<td>3</td>
<td>Nadbai</td>
<td>114 (100.00)</td>
<td>10 (8.77)</td>
<td>25 (21.93)</td>
<td>61 (53.51)</td>
<td>17 (15.79)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>Bharatpur</td>
<td>154 (100.00)</td>
<td>28 (18.10)</td>
<td>31 (20.13)</td>
<td>81 (52.62)</td>
<td>13 (8.4)</td>
<td>1 (0.65)</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>Weir</td>
<td>142 (100.00)</td>
<td>7 (4.93)</td>
<td>27 (19.01)</td>
<td>89 (62.68)</td>
<td>19 (13.38)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>6</td>
<td>Bayana</td>
<td>159 (100.00)</td>
<td>18 (11.32)</td>
<td>36 (22.64)</td>
<td>90 (56.60)</td>
<td>13 (8.18)</td>
<td>2 (1.26)</td>
<td>--</td>
</tr>
<tr>
<td>7</td>
<td>Rupbas</td>
<td>141 (100.00)</td>
<td>5 (3.54)</td>
<td>25 (17.23)</td>
<td>94 (66.67)</td>
<td>14 (9.93)</td>
<td>2 (2.13)</td>
<td>--</td>
</tr>
<tr>
<td>8</td>
<td>Kumher</td>
<td>111 (100.00)</td>
<td>10 (9.011)</td>
<td>30 (27.30)</td>
<td>53 (47.75)</td>
<td>17 (15.31)</td>
<td>1 (0.90)</td>
<td>--</td>
</tr>
</tbody>
</table>

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Hamleted Settlements

Physical environment, notably, the nature of terrain and the drainage system to be main factors which have influenced the growth of hamleted or dispersed settlements in the district. Settlements like Purabai Khera, Brahmanwad, Mehmudpur, Narli etc. are located in the river loop. Another important factor appears to be caste system in which people belonging to be a particular caste prefer to live closely. Isolated settlements like Chak bhobi, Ram nagar, Kumha, Bahaka etc. Another factor in the development of such settlement in agriculture operation. The time consumed in moving from house to agricultural implements to long distances, the watch and ward arrangement etc. have also resulted in the emergencies of hamlets.

Semi Compact Settlements

Such settlements spread all over the district except in the low lying area which are frequently inundated. Semi compact settlements are wide speared and appear to predominant the mustard and the bajra producing area. Availability of water from lakes and case of transport and Communication are other factors which help the growth of semi-compact settlement e.g. Chulhera, Nahera Chauth, Mudia Saad, Kamalpur along the road.

Compact Settlement
In the development of compact settlement, factor like level and productive agriculture land, availability of water and railway roads etc have their role but the chief determinant seems to be socio-political. For example, the big land lords or the former zamindari always live near their ancestor property and are settled in groups in order to have a strong over their territory. Big and compact settlements having a population of 10,000 or more like Siswara, Sinsini and Bayana rural. In those settlements the joint family system was popular and several families of the clan lived in these compact settlements which were enclosed by mud wall or an ancient fort built in the medieval period.

6. FACTORS AFFECTING RURAL SETTLEMENTS TYPES

The rural settlement types are the outcome of the interplay between various agglomerative and deglomerative factors.

Factors Leading to Agglomeration

1. Uniformity of Relief and Soil Fertility

Agglomerated type of rural settlement has been the chief characteristic of homogeneous leveled and fertile plains. Although soil variations are found all over the region, and even within the limits of the Panchayat Samiti boundary itself but its general productivity has enabled the rural population to live close together. The homogeneous stretch of fertile well watered alluvial plains encourages large concentrations of rural settlements. The ever-growing population in such plains leads to intensive farming,
which is also conducive to the concentration of settlements. The general sameness of the natural scene, coupled with an almost uniform fertility of the soil over most of the plain has fostered a sense of community life and motivated the people of the study area, to live in compact settlements.

II. Water Resources

The village water reservoirs ponds and jhils carved out with the excavation of earth for house building and even for water supply purposes are a great source of water accumulation against the seasonal distribution of rainfall for irrigational facilities, bathing and other domestic purposes and are conducive to compact type of village settlement. In the areas of deep water table, owing to the difficulty and high cost of construction, masonry wells are infrequent and population clusters in compact villages around them; while in the zones of high water table, where such wells are more numerous because they can be cheaply constructed and there is no need to concentrate in one site so it is likely to spread out into several outlying hamlets. The need to store water against the seasonal distribution of rainfall and its vagaries is again conducive to the formation of compact settlements over higher and drier interfluves of the rivers. Near the rivers, construction of artificial embankments parallel to the streams as a protection from flood has encouraged the growth of agglomerated settlements.
Collective building of dams and irrigation channels for the storage and distribution of rain water and the construction of tanks for artificial irrigation, have also promoted the evolution of compact villages.¹

III. Cultural Factors

The following are the cultural factors responsible for the establishment of compact settlements:

1. Man is the most gregarious animal and he tends to gravitate towards his fellowmen. Forest clearing, cultivation of land and related activities centralized at one place and agricultural cooperation and practice of the past as well as present have been conducted to compact settlements. Necessity for cooperation in the regulation and control of water, digging wells, upkeep of certain public works and preparation of the environment to make it favourable to crop.²

2. Fragmentation of holdings and strip cultivation preset disadvantage to the village dweller, which are best, counterbalanced by nucleation where former avail all the amenities of close and warm communal life. Blache rightly remarks "concentration of living quarters is necessitated by the diversity of

parcels to be cultivated because their only common meeting ground is the village, whither all paths lead.”

3. Jat clans have helped the settlements to grow into compact habitations enclosed by mud walls, ditch or around a fortress doing the process of occurrence. To these were attracted groups of other people like priests, menials and artisans who aided in maintaining the solidarity, and self-sufficiency of the rural organization.

4. The reciprocal relationships under the jajmani systems have tended to maintain compactness since long. According to Enayat Ahmad the social gathering in the centre of the village usually under some shady tree or near the temple, the mutual rejoicing on festivals, the gathering of neighbours after the days work near the well in summer and round the fire in winter when tales are told and talks of friends and crops exchanged, all these have contributed their influence in the direction of compact settlement.

5. Big cultivator or village Mahajan (money lender) exercises centripetal force for settlers.

6. Unemployed or semi-employed labourers engaged themselves in the subsidiary occupations, which can easily flourish in such villages. Similarly, a host of intermediaries like petty traders find it

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1. Ibid.
convenient to supply articles of everyday life and purchase grain in
time of need in compact villages.

7. Land system also associated the landlord and cultivator well
in compact villages.

8. Religious centre along river and near spring also attract
agglomerations around them. Temples in the middle of such big
settlements still signify their historical role.

9. Some villages grow as compact settlements due to definite
political bias or administrative decision.

10. Defence plays a significant role in agglomerations. During
the eighteenth century no isolated habitation was considered
secure unless protected by a fortification wall and ditch.¹

11. Hall observes that compact village from is well adapted to the
mode of life of a paddy area. Various operation lined with paddy
cultivation generate such centripetal force.²

12. According to Mukerjee that the seasonal idleness of the
peasant, especially marked in the rice region contributes to the
development of the large variety of cottage industries, which can
thrive only in compact settlement.

13. During old days, new sites were rarely selected to live
separately due to being inauspicious till it was approved by a
group of settler after getting confirmation from the priests.

¹ Growse, F.S., 'Mathura: A District', 'Memoirs', New Delhi, Asiatic
² Hall, R.B. 'Some Rural Settlement Forms in Japan', Geog. Rev. Vol. XXI,
No. 1, Jan. 1, 1931, p. 98.
Factor Leading to Dispersion

I. Physical Factors

i. The dispersion appears to increase direct proportion to the ruggedness of the land surface. The uneven nature of relief, soil and ground water results in the formation of scattered settlements. The Bharatpur district is marked by the presence of usar lands, broken terrain by small ravines, ponds and jhils, which have promoted semi-compact and helmeted types of settlements.

ii. Abundance of surface and high water table has also influenced the growth of fragmented settlements. When surface water in the form of tanks and ponds is plentiful, each one of these may have a small hamlet around it. Of course, large tanks or tals may be conducive to large settlements. In areas where water table is high the construction of masonry or non-masonry well is cheap and easy and therefore it may be a suitable location for a small settlement.

III. Floods plains of large streams are also responsible for the scattering of settlements. In low-lying areas which are annually inundated during the rainy season, elevations, within the village are selected as suitable sites for establishing small hamlets, their number depending upon the number of elevated sites.

II. Cultural Factors

i. Socio cultural factors such as castes, prejudices and the existence of low agricultural castes have been partly responsible
for the growth of hamleted settlements. The caste system based on social hierarchy divided the population into various social groups. At the lowest level of the social ladder are supposedly low caste people, so-called untouchables or Harijans, which includes castes like, the Nais, The Chamar and the Bhangis. These people have traditionally been forced to live a little away from the main site, often towards the south, while the upper castes occupied the central site. Thus the caste hierarchy has also been responsible for the dispersion of rural settlements.

ii. Land tenancy and absentee landlordism have also made their contribution towards fragmentation of settlements. Landlords use to settle near their holdings, and agricultural labourers, who were bound by loan or by cultivable lands given in return for services rendered, were required to stay a little away from the main habitation. As a result, the fragmentation of settlements took place. Besides this, most fertile fields were occupied by the landlords, while the less productive and poor lands lying away from the central sites were under the possession of tenants, who will built their houses near their fields. After the abolition of the zamindari system, the actual tillers of the soil became free to settle anywhere in the village, causing further fragmentation of settlements.

iii. Economic factors such as development of roads, railways and opening of new market service centres etc. have stimulated the tendencies towards hamletion of village.
CHAPTER V

PATTERN OF RURAL SETTLEMENTS - A QUALITATIVE AND QUANTITATIVE ANALYSIS

1. HISTORICAL ANALYSIS
2. SHAPE ANALYSIS: TRADITIONAL APPROACH
3. SHAPE ANALYSIS: GEOMETRICAL APPROACH
4. TRANSFORMATION OF VILLAGE SHAPES
A rural settlement is a complex entity and its study pertains to the description and analysis of the distribution of buildings by which people attach themselves to the land. It is an occupancy unit, represents an organized colony of human beings, including the buildings in which they live or work or store or use them otherwise and the tracks or streets over which their movements take place. The pattern, shape or the arrangements of the settlements are solely determined by physico-cultural and socio-economic conditions of the region. It is evident that an isotropic surface in terms of physico-cultural landscape is found absent in every region certain diversities do exist. Therefore it is obvious to find some variation in their pattern.

The word 'pattern' is often equated with the word 'shape'. However, there are geometrical dissimilarities between these two terms. A closed curve has a shape whereas a non-closed collection of points has a pattern\(^1\). A settlement therefore has a shape because its boundary is a closed curve, which circumscribes an area, or a space of two dimensions. The pattern of points are zero dimensional objects whose pattern is operationally determined by the relative distances or spacing of the points with respect to one another.\(^2\) According to the basic properties, pattern can be

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classified into three categories: (i) those having the patterns of Euclidean geometry, (ii) those which are independent of scale and density, and (iii) those which may be expressed the relative spacing of the individuals in the distributions. In this context it may be noted that a single distribution may have different patterns at different quadrant sizes.

Settlements pattern denotes the shape or arrangement of settlements in relation to natural or man-made feature such as streams, ridges, canals and roads. It is determined on the basis of the location of houses and highways. It bears the shape of settlements, and the relationship between one dwelling and another, sometimes irrespective of site. In the study of the settlement patterns two fundamental things have to be taken into consideration. First, the pattern should be abstracted from the habitat. Secondly, the pattern should also depend upon the kind of houses people wish to construct. It may consist of cattle sheds, granaries and out houses. Sometimes a store, a garage, a post office or a school may determine. The pattern of settlement.

Villages differ greatly from one another in shape and pattern by reason of differences in the arrangement of streets and houses. As a matter of fact the street system within a settlement is the

1. Ibid., p. 548
most crucial element because houses are generally built facing a street or a road. Moreover, cultural elements such as the location and places of worship, sometimes give a distinct character to a dwelling site. The study of a settlement pattern includes two aspects i.e., (i) the external layout and (ii) the internal plan. As stated in the preceding chapter, both these aspects are closely related to various geographical conditions, such as location, configuration of land surface water, (rivers, canals, tanks, ponds, wells, etc.), the nature of soil vegetational cover, and shape of the cultivated fields.\(^1\) Beside these physical conditions historical events, cultural traditions, patterns of roads and streets and other features such as temples, mosques, churches garrison etc. also influence the settlement patterns. The state of insecurity in the past and the present social ethos of the rural society are other (significant factors in the development of pattern.\(^2\) Grouping of houses due to certain reasons assumes different forms as a result of which many distinct patterns emerge. There may be settlements where no pattern is recognizable. As such, patternlessness becomes a pattern in itself and is usually the consequences of crisscross working of various causes and function of a settlement.\(^3\) Arrangement of these houses is conditioned through the factor like roads, cart tracks, and water facilities, while lanes from the


\(^2\) Ibid., p. 99.

skeleton of the layout of a village. Building location in the space within the skeleton determine the shape and form the village, as does the flesh in the human body.¹

1. **HISTORICAL ANALYSIS**

   Apart from age-old social mores and hierarchies regulating the Indian village community, the broad, determining features of rural settlement patterns seem to be four. First, the terrain and water, point; second, the needs of cultivation; third, the needs of security and defence, and the fourth, the inter-relationships and hierarchy of castes and the strength of the jajmani system. From the ancient period up to this age these factors determine the different patterns of settlements. Therefore, the study of its historical evolution based on archaeological evidences, historical sources, toposheets and field surveys become very important.

   The Jain texts speak about Uttanmalla Kakara (looking like an open bowl) in Avanmukha (circular in pattern) Khanda (Semi-circular) Patalika (avenue pattern), Valabhi (settlement with the trees planted at the four corners) and Ruchak (with uneven ground with threes).

   Mansara Shilpshastra and Arthashastra have description about rural plans of Aryan villages. The pattern was based on the swastikka marking the cross roads of an Aryan village which runs

north and south and east and west. They were terminated at the four gates dedicated to four positions of the sun.\footnote{Bushman, K.H., "Settlements and Habitations in India", Geographical} According to Mansara Shilpshastra, there are eight types of Aryan villages, Dandaka, Sarvatobhodra, Nandyavarta, Padamaka, Swastika, Prastara, Karmuka and Chaturmuka (Fig. 5.1). It explains that most of the plans were rectangular or square shape. A wall surrounded each village with a ditch for defense purposes. There was generally a gate in the middle of each of the four quarters. A temple, a tank or a public hall usually occupied the centre of village. Straight streets further subdivided the four quarters. Members of a particular caste or profession inhabited each block the best quarters were generally reserved for Brahmins and people of other high castes. The easterly axis of the general plan and the intersection of the main street by north south running shorter street bore relationship with climatic conditions. Such an arrangement ensured the advantage of sunlight and proper ventilation. These plans have, however, been obliterated modified, during the long period of history and only relics are visualize in the form of fortresses or walled villages.

1. Bushman, K.H., "Settlements and Habitations in India", Geographical
PATTERN OF RURAL SETTLEMENT IN ANCIENT PERIOD

DANDAKA

SARVATOBLHADRA

NANDYAVARTA

PADMAKA

SWASTIKA

KARMUKA

PRASTARA

CHATURMUKHA

Fig. 5.1

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DITCH  TANK
CIRCUMAM- T-TEMPLE
-BULATORY PASSAGE

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The ancient literature and the archaeological excavations have shown that the study area has been occupied since prehistoric times. There are large number of mounds in the district known as 'khera', kheri, tikri, pahar, etc. spread all over the region. These villages do not seem to survive at present in their true forms but they tell their story by its appearance. Hence, the study of the present village patterns is of vital importance. The study of a village plan is made with reference to the layout of the inhabited site based on the arrangement of houses and Villages Street or lanes. This may be clearly visualized in compact and semi-compact villages. The present analysis is concerned with the concept of bounded space, 'in which one's legally defined rights and obligations changed when crossing the boundary' while perceptual space may not be demarcated or defined due to high variation in perception. The territorial limits of a village and its built up area form a geographical space pr bounded space, within which its inhabitants live, move and perform their economic and social activities. The analysis of residential are significant as well as villages become significant as it is observed that territorial spaces in which locational decisions are made, are determined by the correlation between bounded space and other geographical

1. Cox, R.R., Man, Location and Behaviour: An Introduction to Human Geography, New York: John Willey (1972), p. 120.
factors. An attempt has been made here to deal with the traditional view of shape analysis as well as the geometrical form of shapes.

2. SHAPE ANALYSIS: TRADITIONAL APPROACH

Since late nineteenth century, the emerging methodologies indicate the traditional or classical view of shape analysis mostly followed by Meitzen (1895) in dealing with the classification of rural settlement of Germany on the basis of their forms and patterns. Demangeon has added to this in the morphological structure of villages and their plans in describing village shape. Hall used the external forms of settled areas, while studying Yamato Basin, as a basis for the classification of village patterns. Other European geographers have followed his method. Singh has initiated this approach, in describing the layout of villages in the middle Ganga valley. According to him, the entire village is divided into a number of squares or rectangles, each forming separate strips of farms, pasture of gardens and definite fields boundaries like fixed village limits. In the settlements pattern, two elements are common, i.e., the main inhabited site and the hamleted site while the arrangement of inhabited sites vary in their shapes.

The present analysis of village pattern is primarily concerned with clustered settlements. Congregation of a number of dwelling and arrangements of associated lanes give rise to different village patterns. So the compact and semi-compact settlements are taken into consideration. Villages of varying shapes have been selected for this analysis from the Survey of India's Topographical Sheets on the scale of 1 cm to 500 mete or 1: 50,000. The selected villages have been checked during the field survey. The region under study has a long historical background and varied physical conditions. The area has several patterns of villages influenced by diverse, physical and cultural conditions.

**Rectangular Pattern**

This is the most common shape of the nucleated settlements. This is not only true for this district, but also for other parts of India, China, Japan and Italy. The main causative factors for this pattern is the rectangular division of land prevalent in ancient times known as the bigha system, comparable with the jori system of Japan, handen of China and jugerium of Italy. Rectangular pattern is also mentioned in the Mansara. In India, bigha system is based on square units, which is responsible for the emergence of this pattern of settlement. The rectangular alignment of dwellings

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with their main axis from north to south and east to west is also
designed to get maximum sunlight and fresh air. The other
advantages of this shape lie in maximum accommodation of
dwellings in a number of rows parallel to each other. In brief,
whenever human habitations are agglomerated, the plan of the
village conforms broadly to rectangular shape and when it did not
have a natural growth, the pattern is generally irregular or roughly
rectangular or square. Kayasth Ganwri, Aichi Khurd, Aichi Kalan
etc. are some of the examples of this pattern (Fig. 5.2 A1, A2, A3).

Square Pattern

The square and the rectangular patterns are complementary
to each other. Due to attractive but restrictive physical forces in a
village site a square settlement may be turn into a rectangle one,
and vice versa. The crossing of cart tracks or roads leads to the
formation of this pattern. Villages lying at the intersection of two
cart track give rise to four distinct blocks, all in square in shape.
Existence of grooves, tanks or ponds, road etc. restricts the growth
of houses outside the squares. Some times there is an unbuilt
space is presenting the centre owing to the presence of a tank or a
temple or mosque or a garden or by any other feature. Some of the
good examples of square pattern of settlement in the Bharatpur
District are Rajpur Khanpur, Fatehpur Chak, Ukasia and
PATTERN OF RURAL SETTLEMENTS

Fig. 5.2

SOURCE: SURVEY OF INDIA TOPOGRAPHICAL SHEET No.

$54 \frac{2}{2}, 54 \frac{4}{3}, 54 \frac{5}{4}, 54 \frac{6}{5}$

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Elongated or linear Pattern

The linear pattern is recognized by the arrangement of houses along a line or a series of lines. The settlement is prolonged in one direction and restricted in another due to certain physical features. The occurrence of this type of pattern is associated with the flood affected areas and proximity of a river. Whenever the site is a narrow strip in between two streams flowing very close together the village becomes elongated. Among cultural factors metalled or unmetalled roads and railway lines also result in the elongation of villages. Roads and cart-tracks attract the people to settle along them. In the past the danger of troops or organized robbers attacking the villagers prevented the growth of settlements along the roads, but now a days considerable number of market villages may be seen along transport lines. Hasanpur, Kankerkhera, Shabga, Sarurpur kalan are some of the best examples of elongated type of villages are shown in (Fig 5.2.C1,C2, C3,C4).

Grid Iron or Chess-Board Pattern

Gridiron or the chessboard plan denotes a "right angled mesh of streets with or without central rectangular market place".\(^1\) Chessboard pattern in the feature of some large rectangular and square villages. In such large settlements two streets correspond-
ding with the four gates of the village wide enough to allow the passage of bullock-carts cut each other at right angles. A few other subsidiary lanes run parallel to the main lanes, in order to provide access to other houses of the village. Generally the village is divided into tolas based on different castes and each grid may be occupied by one caste. Some of the examples of gridiron pattern in the study area are Mundali, Naglamal etc. (Fig. 5.2, DI, D2).

**Circular Pattern**

This pattern may have several variations, resulted from an attempt to build a maximum number of houses at one site. The houses may be concentrated for the purpose of defense, or around the mansion of the local zamindar. This pattern is a heritage of the past, particularly of the eighteenth and nineteenth centuries, when the security of the villages were uncertain. According to Ahmad the circular form was a natural result of maximum aggregation for the purpose of defence, around the mansion of the local zamindar, who used to protect the peasants against a for-ay by a neighbouring chief. Sometimes a semi-circular plan may develop on the crescent shape of the meander. In some cases natural barrier like shallow marshes or lakes, etc. or religious buildings like temple or mosques, ponds, wells or market places etc. also produce such a circular pattern. Due to the presence of these

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2. E. Ahmad, op.cit., p. 105.
cultural features in the centre, hollow circular pattern is developed. In the study area Faizpur Ninanah and Kanoni are the best examples of circular pattern (Fig. 5.2, E1, E2).

**Radial Pattern**

Radical pattern is quite similar to the circular pattern with a slight variation in the internal as well as external structure of the layout. The radial pattern of settlement is conditioned by the radiating character of cart tracks or lanes, which converge on a central point, such as the houses of zamindar, a place of worship, a sweet water well or village shop etc. Shafiabad Loti and Ajrara villages are the examples of such type (Fig. 5.2, F1, F2).

**Star Pattern**

When the circular settlement extends in several directions along the footpaths and roads, the village assumes star shapes. The occurrence of such settlements also takes place with the construction of new dwellings on the fringe of circular and square shaped rural dwelling on the fringe of square shaped settlements. Village Karnawal is a good example of star shaped pattern (Fig. 5.2, G).

**Double Nucleation**

Where the two settlements develop at a single site it is called 'double-nucleation'. In rural areas a minor stream is often the cause of such a pattern. Sometimes a mound, a road, a tank or a
river may result in the development of twin settlements situated on
either side of it. It is also caused by the construction of new shops
at the railway station. Though the distance may be one or two
kilometres from the parent village. Examples of such villages are
Alamgir Badhia and Jasori (Fig. 5.2, H1, H2).

**Triangular Pattern**

Such a pattern usually occurs on a site where the growth of
the settlement is restricted on three sides by certain physical or
cultural factors. Cart tracks, roads, rivers etc. may restrict the
growth of a settlement. This pattern may also come into existence
at the junction of three roads. The best examples in the District
are Malakpur, Kithor, Tajpura etc. (Fig. 5.2, I1, I2. I3).

**L-Shaped Pattern**

L-shaped pattern is a subsidiary pattern of the rectangular
or square form. It comes into existence when two roads or cart-
track meet at right angles and attract the people do settle along
them. This pattern is found only in Chandlawar urf Mahalwala and
Ganeshpur (Fig. 5.2, J1, J2).

**Amorphous Pattern**

In case the village lanes are dotted with tiny hamlets all
being small rectangles linked with the central site by footpath,
because dispersion of houses with result such an irregular fashion
of piling of houses are made, which leads to a scattering of dwellings over the entire area is known as amorphous pattern. The villages Kalanjri, Kirthal and Bhanbore are the good example (Fig. 5.2, K1, K2, K3).

3. SHAPE ANALYSIS: GEOMETRICAL APPROACH

The quantitative approach of shape analysis is based on the elementary packing theory. In a territory, having various shapes of village boundaries, the efficient division can be best explained in two ways: (i) having efficiency of movement and (ii) having efficiency of boundaries. The first, involves distance minimization in between centre and outer margin, the second, is measured by perimeter length of the territory. The second criteria are more valid because decision and movement are closely associated with village boundaries. As a matter of fact, three geometrical properties, area, shape and connectivity, are the characteristics of bounded space where any simply connected shape can be represented by a polygon with any number of sides of equal or variable length. Circles tend to have an infinite number of sides and vertices, but their series over a region either tend to overlap or to leave a number of gaps. So three kinds of regular tessellations, i.e., triangle, square, hexagons (Fig.5.3) are most suitable for packing an area where hexagon retains most of the

be an ideal geometrical figure owing to its maximum packing capacity, compactness and better accessibility. So the circular geometry has been used for the computation of shape in the present analysis.

Early theorists like Christaller and Losch have used the hexagonal shape to explain spacing, distribution and settlement area. However, it has been lately observed that a rectilinear or rhomboids pattern of lattice could also serve as an alternative to the hexagonal area.

The concept of shape measurement started from the work of Thompson in biological sciences. In geomorphic studies Miller, on the basis of quantitative expression of the shape of the river basin, used circulatory ratio. He concluded that drainage shape $S$, could be expressed as the ratio of the area of the drainage basin, $A_b$, to the area of the circle having the same perimeter $A_c$, i.e., $S = A_b / A_c$. The same formula has been adopted by Haggett in the shape analysis of Brazilian settlements where shape Index ($S$) of a village may be expressed as the ratio of the area of the village ($A$) to the area of the circle with the longest axis ($L$) as a perimeter ($\pi R^2$). So

EFFECTIVENESS OF ALTERNATIVE TYPES OF REGULAR POLYGONS IN RELATION TO DISTANCE FROM CENTRES AND PERIMETER LENGTH

**Fig. 5.3**
that \( S = \frac{A}{\pi R^2} \) or \( 4A/\pi L^2 \) or \( S = 1.27 \frac{A}{L^2} \)

Where,

\( A \) = area of the county in \( \text{km}^2 \).

\( L \) = Longest axis of the county as a straight line connecting the two most distant points on the perimeter.

Here the multiplier, 1.27 is computed to adjust the shape index ranging from 1.00 (a circle) to zero in elongated shape. The values are 0.42 for triangular, 0.64 for square and 0.83 for hexagonal shapes. To represent the shape ratio of a circle in percentage, multiplier of 100 may be added. Simmons, Boyce and, Clark, have analyzed the shapes of urbanized areas rather than their population using the framework of circular geometry, while Wilkins and Shaw have taken the population attributes as well as urbanized area and have also tried to develop formula for the measurement of shape distortion and their testing procedure.\(^1\)

The methodological principles adopted for the analysis of shape of rural settlements, the measurement of shape of rural settlements given by Miller, have been used, because of its

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Source: Compiled from District Census Handbook Bharatpur (1991)
Table 5.2

Shape Characteristics of Selected Villages

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<th>Shape Index</th>
<th>Contact Index</th>
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<td>0.8-0.9</td>
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Source: Compiled from District Census Handbook Bharatpur (1991)
Table 5.3
Special Characteristics of Selected Villages

<table>
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<tr>
<th>Villages</th>
<th>Area in Km²</th>
<th>Population Density in persons per km²</th>
<th>Shape Index</th>
<th>Contact Number</th>
<th>Contact Index</th>
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Source: Compiled from District Census Handbook Bharatpur (1991)
Bharatpur District
Relationship of Contact Index, Population Density & Shape Index

(90 Sample Villages)

Fig. 5.5

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measurement of shape distortions and their testing procedure.¹ There are 1345 inhabited villages in the District, only 90 villages have been selected on random basis to undergo the shape analysis. Shape indices obtained as per Miller's formula for 90 sample villages of the District are given in Table 5.1 which shows that 56.76 per cent of the sample villages i.e., 51 lie between the shape indices of 0.3 and 0.7, the average shape index of the study area is 0.638. A perusal of Table 5.2 shows that 17.78 per cent of the villages conform roughly to rectangular or square shape. This is mainly due to the rectangular system of land division, i.e., bigha system, prevalent during earlier times. There is no village which represent very elongated shape i.e., < 0.1 while nine villages approach nearly circular shape i.e., > 0.9. They are Chhachharpur, Shabga, Bohia, Dagarpur, Mavi Kalan, Rithali, Tigri, Paii and Sarangpur. The frequency of villages in different shape groups has been plotted in Fig. 5.4A, which represents the triangular square and hexagonal lattices, and reveals a general trend from elongation to square, and the area does not show the gaps among groups of frequency distribution of shape index as in the case of Brazilian counties.

The second characteristic of shape analysis associated with the hexagonal tessellations in the number of contacts between any

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one territory and the adjacent territories. In the regular hexagonal system the contact numbers is 6, while for the triangle the number is 3, and 4 for the square. The contact numbers in the sample villages have been shown in Table 5.2 along with the histogram (Fig. 5.4C).

The mean contact number of sample villages is 5.422, which is near to 6 observed in a strictly hexagonal system, which may be referred as the representative of the study area. This is further corroborated with the fact that 63.3 per cent of the sample villages record contact number between 5 and 7. The contact index as exhibited in Table 5.2 and Fig. 5.4B show that 87.8 per cent of the sample villages have contact indices between 1 and 3.

There appears to be no correlation between contact index, population density, and shape index (Fig. 5.5) because of the homogenous nature of the region. Due to some forces of attraction, population density becomes very high at some places. Table 5.3 gives a list of selected villages showing various categories of village shapes to highlight the relationship between shape and area population of the sample villages.

4. **TRANSFORMATION OF VILLAGE SHAPES**

The concept of transforming village shapes is analyzed within two perspectives of constructing serial polygons making delaunay triangles and cellular nets, the hexagon. Although its root goes
back to mid nineteenth century (1850)\textsuperscript{1}, when mathematician Dirichlet introduced the concept of serial polygons, the detailed properties have been studied later on by D'Arey Thompson (1917). Such space exhausting polygons are known as cellular net' in geography, 'mosaics' in ecology, 'Thiessen polygon' in meteorology, 'Dirichlet' or 'Voronoï' in mathematics. Instead of the equilibrium system of economic and spatial area, Dirichlet found tessellation of serial polygon with maximum packing density, which he defines as, 'the ratio of the area of a circle to the area of a polygon in which the circle is inscribed'. Since this density will be evidently less than 1, the required polygon will have density closest to 1. Thiessen polygon implies that diagonals are drawn between village sites and perpendicular bisectors are erected to form a network of serial polygons.\textsuperscript{2} The main advantage of such polygons lies in the fact that they enclose within them areas that are nearer to the village centre than to any other centre and no change in the existing village site is necessary to have effective control over the enclosed territories. The other method, that of the hexagon, used by W. Christaller (1933) in his 'Central Place Theory' is based on the concept of uniform space and is very popular in geographical writings owing to its maximum packing capacity and uniform size.

It is difficult to use this method for a broader region, however, samples may be taken for comparative study. Three areas of discrete ecological settings from different tehsils. (Fig. 5.6, A1, B1, C1) have been taken for the present analysis. It is found that village sites are mostly associated with attractive forces (physical and cultural) and market centres have been developed at the intersection of roads.

The transformation of village boundary into regular polygons indicates that, as the number of market centres increases, sales in individual market centre decreases. This trend denotes the low cumulative purchasing power of persons inhabiting in the region concerned. Within this frame, Christaller's k3 value can also be tested which will show inverse relationships, that is, an increasing k value signifies better economic efficiency of a region, as shown in (Fig. 5.6, A3, B3, C3), according to which it has increased from 7 to 9 in one case and to 21 in another.

The transformation of village shapes into the hexagonal system is Comparable to the theory of connectivity, which follows from 'Christaller's traffic principle.¹ in fact, increasing K value affect connectivity in the same fashion as may be clearly seen in (Fig. 5.6, A3, B3, C3) where the increasing k value signifies increasing trend in connectivity by denoting better purchasing

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TRANSFORMATION OF VILLAGE SHAPES INTO THIessen POLYGONS AND HEXAGONS

- VILLAGE
- RURAL MARKET CENTRE
- VILLAGE BOUNDARY
- METALLED ROAD
- UNMETALLED ROAD
- SERVICE AREA
- IDEAL TRANSPORT

Fig. 5.6

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power. It is significant that Thiessen polygon are the most suitable for the transformation of village shape into regular polygons, because in this method the settlements are taken into consideration as they are (Fig. 5.6, A1, B1, Cl).

From the foregoing discussion it may be concluded that the shape analysis by qualitative method indicates the role played by different physico-cultural factors operating in a region whereas quantitative analysis gives the picture of an ideal pattern of settlement. So village shape analysis is most useful, as a tool for the purpose of village planning.
CHAPTER VI

RURAL DWELLINGS AND HOUSE TYPES

1. EVOLUTION OF RURAL DWELLINGS
2. MORPHOLOGY OF RURAL DWELLINGS
3. HOUSE TYPES AND THEIR DISTRIBUTION
The dwellings are the representative of the human imprint upon the physical landscape, showing the people's traditional as well as modern achievements pertaining to a changing scene, thus depicting of the complex structure of man-environmental relationship through various dimensions, as Brunhes has also advocated that the houses are the products of cultural traditions and natural conditions.¹

The term 'rural dwelling' includes not only the residential houses ranging from the humblest huts of the poor to the most elaborate and massive city mansions, but all other human structures such as schools, factories, warehouses, Churches, Mosques, Temples etc.² A house may be defined as the structure or part of the structure, inhabited or vacant, a shop or a shop cum-dwelling or a place of business, workshop, school, etc. with a separate entrance. A house is used by man as a resting place to recoup his lost energy and also to protect himself from the vagaries of weather and wild animals.

Agglomeration of houses marks the origin of settlements and reflects the nature of the region, since their character is related to the environment and the cultural heritage of the people.³ Since the dawn of human civilization, physico-cultural and socioeconomic

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factors played significant role in determining the character and composition of rural dwellings. It is the best manifestation of the environment, which may be seen in layout, plan, nature of building materials, and morphology. As such, a peasant’s house is of great geographical interest since it is a reflection of the direct influence of the environment. Peasant’s dwellings are rather simple in their structure and layout. Geographical factors in combination with socioeconomic factors produce an architecture in which style plays little or no role. The peasant, with most meagre resources at his disposal constructs a simple structure, using locally available building materials. Therefore, it is obvious that rural dwellings reflect the cultural heritage, functional needs and positive and negative aspects of non-cultural environment.

The study area is a uniform plain, there exist diversities at micro-level in physico-cultural and socioeconomic conditions. Similarly, variations in religious rituals and caste structure are also found throughout the region. These factors determine the form, layout, architectural design and building material of the rural dwelling in the region.

Rural house types in the District clearly indicate the influence of physical environment as well as cultural, on the form, function and structure of houses. For example, available building material points to the micro regional characteristics of geology, soil and vegetal cover. The size and height of the houses and use of
different materials indicates the economic condition of the people. The climatic elements, particularly, temperature, wind direction, and rainfall, influence the orientation and structure of rural dwellings. Flat mud roofs, a salient feature of the rural houses of the District, distinguish these houses from those in other parts of the Rajasthan. This type of roofs effectively keeps off internal heat, and if well laid, may last up to years under normal conditions. Climate remains the main consideration of the people while building their houses facing the east instead of the west. The former are better ventilated and receives sunrays of early morning, while the latter are subjected to the scorching after-noon sun, as well as westerly dust storms in the summer season. An open courtyard is an inseparable feature of rural houses because it provides ample sunshine and heat to the inhabitants during the winter and a comparatively cool place for sleeping during summer nights. Different mode of activities of the people result in differences in the structure, styles, sizes and plans of the houses of tradesmen, blacksmiths, carpenters and shopkeepers etc. Similarly institutions such as schools banks, hospitals, post offices, panchayat buildings etc. are designed to meet their specific needs.

1. **EVOLUTION OF RURAL DWELLINGS**

   Historical and archeological evidence clearly reveals that rural dwellings in the study area go back to 1500 BC. This is borne out by the legend and folklore of the area, by the presence of
a large number of mounds, and more convincingly, by the archeological excavations in different parts of the District. The present form of rural dwellings is the outcome of thousands of years of cultural and economic progress in the study area. It is known that settled life began with the Neolithic age. It is generally believed that the earliest form of human dwelling was the cave.¹ Then people started living in man-made dwellings, i.e., thatched huts, along the tributaries of major rivers or near other water bodies. The shape of the huts, in all probability, must have been circular or oval. It is presumed that the prehistoric men, taking their clue from shady trees like the banyan, constructed their first circular huts constituting of reed, twigs, tree leaves etc. in the forest of the region to lead a more sedentary life.² These types of houses are still seen along the rivers of the District. In due course, these huts were clustered together and the whole settlement was protected with fencing of tree trunks and bamboo etc. Some of these huts were arranged in rectangular or square shape. Thereafter, as a result of the development of economy and improvement of skills, an addition of courtyard was made to each of them, which provided protection for the cattle besides, having

other functions. Brown bricks and stones were the predominant building materials during the Buddhist period. Archaeological remains of the Gupta and the Harsha Vardhana period suggest that the arts flourished in the District. During the ascendancy of the Moes, Kols and Bhars, a change took place in the pattern of the dwellings of the region. Their houses were generally made of clay and wood with circular and rectangular structures using reeds or thatching grasses to construct conical roofs on wooden poles. During the Mughal period most of the tombs, mosques and buildings built by the rulers show magnificent blending of Indian and Persian architecture in the District. The Jama Masjid of Bharatpur may be Cited as an example.

Similarly, during the British period, new types of building materials like cement, brick, lime and Iron-bars gained wide popularity, especially in construction of government building. But the rural dwellings were deprived of such material. Only the mansions of the affluent people like Zamindars, Jagirdars and public buildings used this material. In post-independence period, certain changed in the structure and plan of the rural dwellings

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have taken place due to improvement in the socio-economic conditions of the people. Burnt brick, cement, mortar, iron bars, stone slabs which were earlier used only by affluent people or in public buildings, are now being used even by the people belonging to the middle group in the District. The majority of the rural houses in the region continue to be built with available local material like mud, wood, thatching grass, etc.

2. MORPHOLOGY OF RURAL DWELLINGS

The physico-cultural and socio-economic factors of the region have caused variations in building materials, ground plan architectural styles, size and shape of the dwellings. However, certain features of rural houses such as courtyard, verandah and raised platform have been found to be common in most of the north Indian rural dwellings.¹

1.1 Courtyard

Courtyard is the most distinguish feature of the traditional Indian rural houses. This courtyard locally known as angan - a rectangular open space, north south oblong is surrounded usually on four, three or two sides by rooms and the remaining sides by walls (Fig. ...). The main entrance of the house is generally located in the fourth wall, which is built only for the privacy of the angan of the house. The courtyards in the houses of upper and middle

class people are used for maintaining family privacy, while poor people consider it as the best source of relief from congested accommodation and a place where they can keep their cattle and agricultural implements. It compensates the lack of sun light in the ill ventilated compact rooms of the dwellings and is also used for sleeping purposes of female members as well as for various indoor works i.e., sunbasking during the winters, drying, grinding, threshing, cooking and various social and religious activities.

The courtyard represents rectangular open space of diverse site, size, shape, situation, function and surroundings depending upon the need, available space or only the whim of the occupants. Its situation and layout are also an indication of status of the occupants. The most common occurrence of the courtyard is in the backside, where it is surrounded by an inner verandah, attached to the main or by the wall of these rooms, and an outer wall, rarely having a door fond in modern type of dwellings.

1.2 Verandah

Another notable feature of rural dwelling in the roofed or thatched verandah. Males use the outer verandah, in front of one side of main door, mainly, for sitting, receiving guests, keeping fodder, poultry and goats in poor houses and for sleeping purposes. Especially in rainy season sometimes it is also converted into shop for selling small items of daily need. It is also used as a work place by village craftsmen like carpenters, blacksmiths and
Fig. 6.1
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weavers. The inner verandah extends over the entire length of the courtyard on one, two or three sides. These verandahs are well supported by walls of mud or burnt or unburnt bricks or wooden pillars. Some verandahs have kitchen, others, a store place for implements and some cattle folds. Their presence provides light to the inner rooms, protect walls from rain showers, keeps floor inside dry and enables fair approach to the rooms during rains and also to cattle for feeding and milking. Mostly, the well to do dwelling's verandah has a Jhoola. It also serves the purpose of sitting, sleeping, chattering and gossiping.

1.3 Raised Platform

A raised platform or chabutra in front of the main entrance is an integral part of the rural houses of the area. It is corrupted in the village parlance to chauntra. The males use it as a meeting place in the evening. Since this platform faces a lane or street the women belonging to the upper and middle class families rarely use it because they are supposed to remain secluded from the male members outside. However, the women of the weaker section of the society do not have such a restriction imposed upon them and therefore both men and women from the poorer classes use it for different purposes. The chabutra is connected to a dubari (entrance room), which runs from the main entrance to the inner

1. Jhoola (Wooden rectangular plank, tied with strings on four corners, hanging by wooden beams, put transversely on walls or poles).
courtyard. It has a simple or stylish wooden door, depending upon the status of the residents.

An interesting associated feature of rural habitation is the place outside the houses, where the droppings or the cowdung are collected, dried, and heaped into a miniature hut shaped structure called bitorah. They are covered with straw or plastered with liquid dung mixed with straw to preserve them from rains. It is the daily duty of the village women to form dung cakes of different shapes and piled them up after drying them. These bitorah are generally found on the outskirts of a settlement. Another notable feature is burji.

Fig. 6.1 reveals clearly the morphological aspects and the nature of rural dwellings in the region. The basic unit of the rural house is the rectangular rooms, which forms, as before the full dwelling place of several poor families. The one room house has a raised platform in front of it, which is partly occupied by a covered verandah, varies in its size from 4 to 8m and 2 to 4m in length and breadth. The two-room dwelling is an extension of one more room to meet the growing need of more accommodation. Such type of dwellings from an 1-shape, whereas- the three-room dwelling from L-shape where the third added room is generally used as a baithak (Parlour). The four room dwellings are generally U-shape which provides full benefits of the courtyard and the main entrance. Dwellings with five or more rooms are rectangular or square shape.

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These houses generally have angan, a verandah, a kitchen and a storeroom.

3. HOUSE TYPES AND THEIR DISTRIBUTION

Variations occur in dwellings based on the available and use of building materials, which are mostly conditioned by physico-cultural and socioeconomic factors that offer the regional characteristic to the dwellings. House types of the region are classified into two main categories.

Based on building material used
Based on size and shape

3.1 Based on Building Materials

The type of rural dwellings depends largely on the availability of local building materials, the products of soil and vegetation. The rich built houses of burnt bricks, cement, concrete and iron sheets while the poor and middle peasants build mud walls and flat clayey roofs of sun dried it bricks and cover it with tiles or thatch. The basic local materials for the construction of rural houses in the District are mostly mud, wood, bamboo, sugarcane leaves and stalks of plants such as arhar etc. Because of the cheap availability of mud or clay, it is widely used in the construction of rural houses in the study area. It can easily be formed into different shapes even without the help of skilled workers and hence the houses built with such materials are simple and economical. All over the area wall generally made of mud obtained from the
village pond. The constructed mud wall is simple and proceeds in stages with damp mud making successive layers of 30 to 45 cm in height. When one layer is completed and dried, a fresh one is added over it. This process continues till required height is obtained.

Table 6.1 shows various types of wall and roof materials used rural houses of the district. It has been found 32 per cent of houses use mud and unburnt bricks as wall material. Similarly, mud and thatch roofing materials contribute 74.66 per cent of the total rural houses. On the basis of the building materials, rural house in the District may be put into the following four categories:

i. **Grass, leaves, reeds and bamboo walled houses with thatched roof.**

These are the common types of rural houses of the poor people. The quality of thatch used totally depends on the availability of local vegetation and crops. Poor people and usually low caste people find it cheaper and more convenient to make thatched roofs of phuns, kans or leaves by fastening them with moist branches of arhar or strings in a rectangular framework of bamboo. This readymade cover is placed over ridgepoles of logs or
Table 6.1

DISTRIBUTION OF HOUSEHolds BY PREDOMINENT MATERIALS OF THE ROOFS AND WALL

<table>
<thead>
<tr>
<th>Material of wall</th>
<th>Total Households</th>
<th>Grass, Leaves, Reeds, Thatches, wood, mud, unburnt bricks or Bamboo</th>
<th>Tiles, slate, Shingle</th>
<th>Corrugated iron, zinc or other metal sheets</th>
<th>Asbestos cement sheets</th>
<th>Brick, stone and lime</th>
<th>Stone</th>
<th>Concrete RBC/RCC</th>
<th>All other materials and materials not stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>All materials</td>
<td>100.0</td>
<td>74.66</td>
<td>3.81</td>
<td>0.46</td>
<td>0.41</td>
<td>14.69</td>
<td>0.76</td>
<td>1.27</td>
<td>3.93</td>
</tr>
<tr>
<td>Grass leaves Reeds or Bamboo</td>
<td>3.60</td>
<td>3.48</td>
<td>--</td>
<td>0.01</td>
<td>0.002</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2.91</td>
</tr>
<tr>
<td>Mud</td>
<td>7.69</td>
<td>5.96</td>
<td>1.64</td>
<td>0.015</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.08</td>
</tr>
<tr>
<td>Un-burnt bricks</td>
<td>24.31</td>
<td>23.49</td>
<td>0.26</td>
<td>0.05</td>
<td>0.014</td>
<td>0.115</td>
<td>--</td>
<td>0.01</td>
<td>0.36</td>
</tr>
<tr>
<td>Wood</td>
<td>0.09</td>
<td>0.063</td>
<td>0.003</td>
<td>0.003</td>
<td>0.007</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.013</td>
</tr>
<tr>
<td>Burnt Bricks</td>
<td>63.39</td>
<td>41.52</td>
<td>1.67</td>
<td>0.35</td>
<td>0.37</td>
<td>1.45</td>
<td>0.45</td>
<td>1.22</td>
<td>3.33</td>
</tr>
<tr>
<td>GI sheets or other metal sheets</td>
<td>0.08</td>
<td>0.05</td>
<td>--</td>
<td>0.005</td>
<td>--</td>
<td>0.016</td>
<td>0.003</td>
<td>0.003</td>
<td>0.005</td>
</tr>
<tr>
<td>Stone</td>
<td>0.52</td>
<td>0.04</td>
<td>0.14</td>
<td>0.008</td>
<td>0.01</td>
<td>0.003</td>
<td>0.30</td>
<td>0.02</td>
<td>0.003</td>
</tr>
<tr>
<td>Cement concrete</td>
<td>0.17</td>
<td>0.04</td>
<td>0.005</td>
<td>0.007</td>
<td>0.003</td>
<td>0.08</td>
<td>0.007</td>
<td>0.02</td>
<td>0.008</td>
</tr>
<tr>
<td>All other materials and materials not stated</td>
<td>0.13</td>
<td>0.003</td>
<td>0.096</td>
<td>--</td>
<td>--</td>
<td>0.002</td>
<td>--</td>
<td>0.002</td>
<td>0.03</td>
</tr>
</tbody>
</table>
bamboo. Such kind of houses account for about 3.5 per cent of the total number of rural dwellings of the District.

ii. **Mud and unburnt brick walled houses with thatched and mud roof**

Most of the rural people especially the cultivators and agricultural labourers live in these types of houses. Mud walls are constructed with unsorted clay or unburnt bricks and have mud roofs. Chappar, in front of the main entrance is a typical feature all over the region. The poor man's house generally has only one multipurpose room where there is no separate place for cooking, receiving guests or keeping the cattle during the winter night. Such types of dwellings are found all over the study area and constitute 29.5 per cent of the total number of rural dwellings.

iii. **Burnt brick walled houses with thatched and mud roofs**

The burnt brick walled houses with thatched roofs cover about 41.5 per cent of the total rural houses. These types of dwellings are found all over the study area. These roofs are cheaper than brick or stone roofs. The roof may be over hanging on one or both sides, having very gentle slope. These roofs are made by spreading a thick layer of mud over a network straw or pieces of wood or stalks of arhar, which rest upon closely spaced wooden beams or crooked branches of local trees such as mango and neem etc. Sometimes tiles are also used in the construction of roofs also.
the other building material. These tiles manufactured by village potters and also baked in the ordinary firewood. These tiles are placed systematically on a framework of wood obtained from local trees, which rests on the gat of the wall supported by transversely fixed beams. Because of these tiles the roof become more durable in the long run.

iv. Burnt brick walled houses with burnt bricks, stone and lime roofs.

These types of houses are called pucca houses. The brick houses are increasingly in number day by day in the area and it shows the prosperity and higher socioeconomic status of the people residing in a pucca house all the four walls and a brick roof have identical appearance all over the area. Brick stairs are also provided in such houses. These houses provide several advantages such as cleanliness a better utilization of space. The roof is used for sleeping purposes during the summer and for drying grains in the sunshine. Although such houses are unevenly distributed all over the area, they are more in number in rural service centres. These are mainly single storeyed houses consisting of brick walls and pucca roofs. The height of their ceilings is usually between 3 and 4 metre. These houses have separate facilities of latrine bathrooms, kitchens and stairs. Such types of houses account nearly 1.45 per cent of the total number of rural dwellings of the District.
v. **Burnt brick walled houses with concrete RBC/RCC roofs**

Such kind of houses cover about 1.22 per cent of the total number of rural dwellings of the District. Nowadays such a house is a symbol of social prestige. The number of these houses is increasing day by day.

### 3.2 Based on Size and Shape

The size and shape of a dwelling reflects the economic status of the householders. Its size varies from a large Haveli to a single room hut. It is observed during the field surveys that one or two room houses inhabited by poor, middle class people lived in three rooms dwellings the rural rich lived in houses having five or more rooms.

Table 6.2 reveals clearly that one or two rooms dwellings together constitute the highest percentage (63.03 per cent) providing shelter (59.41 per cent) of the population. In such type of houses men and cattle share the same room. These rooms are easy and cheap to construct and unhygienic because the same room is used for cooking, sleeping and keeping cattle together. The three or four room dwelling account 26.21 per cent of houses provides accommodation to 28.38 percent of the total rural population. Five and six room dwellings account for near 10.7 per cent of the total number of rural houses and accommodate 12.1 per cent of the total rural people of the District.
Table 6.2

Classification of the Rural House According to the Number of Rooms and Rural Population Living in Various Types of Houses

<table>
<thead>
<tr>
<th>Type of house</th>
<th>Percentage of the total number of houses</th>
<th>Percent of the total rural population living</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-room</td>
<td>31.13</td>
<td>27.18</td>
</tr>
<tr>
<td>Two-room</td>
<td>31.95</td>
<td>32.24</td>
</tr>
<tr>
<td>Three-room</td>
<td>16.67</td>
<td>17.84</td>
</tr>
<tr>
<td>Four-room</td>
<td>9.54</td>
<td>10.55</td>
</tr>
<tr>
<td>Five-room</td>
<td>4.53</td>
<td>5.10</td>
</tr>
<tr>
<td>With Six or more rooms</td>
<td>6.18</td>
<td>7.09</td>
</tr>
</tbody>
</table>

| Total         | 100.00                                  | 100.00                                      |

*Source: Compiled from District Census Handbook Bharatpur (1991)*

The number of arrangement of rooms brings about the general shape of houses. The houses having one or two rooms are I-shaped. L-shape is found in three room dwellings. U-shape dwellings, consisting of three limbs usually have three or four rooms. Five or more room houses are rectangular, in shape. In the District majority of people live in two rooms dwelling.

The house is not merely a shelter but it forms part of cultural heritage and hence is influenced by the cultural environment of which forms part. So the socioeconomic status of the owner has a direct bearing upon the shape and size of the rural dwelling. Field studies reveal that there is a marked-contrast between the houses of the well to do and the rest of the villagers.
The masonry houses generally belong to the Brahmins. Jats and business class who have a major share in the village land and have accumulated wealth. The rest of the communities live in mud houses. The large masonry houses are well planned with separate facilities of kitchens, bathrooms, storerooms, cattle sheds, fodder stores, chaupals or baithakas. Middle class people usually live houses with 3-5 rooms of burnt or sun-dried brick walls and mud, tiled or stone slab roofs. They have outer and inner verandah, courtyards, cattle sheds etc. Mostly agrarian castes like Gujars, Lodh, Kumher, Meos etc. live in such dwellings. The poor people like chamar, pasis, Koris, Dheemars, Bhangis etc. live in small houses with one or two rooms. The so-called 'untouchables' invariably occupy the worst and relatively isolated locations. These houses are mainly of mud and thatch. The front verandahs in such houses are multifunctional in nature, used as kitchen, parlour and cattle shed. Smaller size of families and lack of purdah system enable them to live in small houses. A person sitting on the verandah can keep an eye on all property and every movement in the house. Pig rearing is common among Pasis and Chamars who build their pigsties adjacent to their houses. This is the most polluted part of the village.

It has been clearly observed during the field survey that rural housing condition is far from satisfactory. Although the government has made efforts to develop and improve them since
independence, these efforts have made very little impact due to meager resources and ineffective organization. In most of the villages majority of houses are one to three room unit built of mud, unburnt brick and thatch. They are constructed in such a way that allows little ventilation. The dwelling complexes have narrow meandering lanes and are overcrowded. The villagers pay little heed to the principles of maintenance of good health and sanitary conditions in the village lanes and bye lanes. Heaps of cattle dung is accumulated at odd places, which breed mosquitoes and other insects. The rubbish in the houses is thrown on the streets. Children are also allowed to defecate close to their houses, which makes the atmosphere foul and insanitary. Due to the lack of proper drainage system small and big pits full of contaminated water overflowed here and there. The stagnant water in the pits invites mosquitoes, which poses health hazard. The cost of maintenance of mud houses is greater than what is required for masonry houses. The mud houses are more comfortable in summer and winter as they are cooler in summer and warmer in winter. But in the rainy season the masonry houses are decidedly at an advantage. In mud structure the rainwater trickle down and the floors become damp.

The few well-to-do cultivators and other rich people in the village may possess extremely good pucca houses, but their living conditions are not always good. For instance, they may have good
new baithaks, but their women live and cook in old unventilated havelis. Although the havelis, as the nest of family life, needs most improvement, the survey revealed that the villagers tend to invest their wealth in construction of impressive baithaks, the equivalent of the city dweller's drawing room and guest room.

The village sites are already densely built up and fully occupied, and therefore they do not provide any scope for planned physical growth of the village. But in order to improve the housing condition of the villages the houses should be simple in design and locally available building material ought to be used in their construction.

Such a design suggested by the National Housing Board for the poor and middle-income group, has been given in Fig. 6.2. It is a design for single roomed houses, suitable for low-income group (Fig. 6.2A). It provides a multipurpose verandah and a courtyard. The two roomed house plans, as shown in Fig. 6.2B, is suitable for medium low-income groups of people. The special feature of this type of house is the maintenance of the privacy of the women-folk, Fig. 6.2C represents the structure of a three roomed house for people of high-income class. It consists of three rooms, a kitchen, a store and a bath. Provision has also been made for a separate cattle shed and a fodder store.
CHAPTER VII

SOCIAL MORPHOLOGY:
A CASE STUDY OF SAMPLE VILLAGES

1. VILLAGE AGHAPUR
2. VILLAGE SINSINI
3. VILLAGE ADHAWALI
The village morphology includes ground plan, general built of settlement and social morphology. The ground plan denotes the layout including length and breadth of streets, the arrangement of the house inside the compound of a household and the location of the main cultural features as mosques, temples, forts, headman’s residence, walls, moats, market place, garden etc. The built of the village comprises architectural style, general conditions of street, front of houses etc. and lastly its third component, social morphology includes functional and social spaces, which are socially and culturally controlled. In fact morphological structure, street patterning and arrangement of dwelling and location secular buildings etc. are all governed by socio-economic and cultural factors. The village community as an integrated living whole “consists of collection of units”, arrangement to form a social structure, i.e. a set of social relation.¹

This study aims to investigate the existing morphological characteristics of rural settlements of the three selected village of different ecological setting in the study area, and to examine the influence of physico-cultural and socio-economic factors, particularly caste and landownership, on the village morphology of the three selected villages in the study area.

HYPOTHETICAL SOCIO-SPATIAL STRUCTURE

A 1. COMPACT SITES

2. HEMLETED SITES

INDIAN VILLAGE-STRUCTURE

RELIGIO-RITUAL MODEL
SECULAR DOMINANCE MODEL
DISTANCE MAXIMIZATION BETWEEN DISTANCE MINIMIZATION BETWEEN
U- AND HIGHER CASTES U- AND HIGHER CASTES
R- RAJPUT B- BRAHMIN A- AHIR K- KAYASTH
H- BHUMIHAR M- KUMHAR N- BARBAR G- GONR S- SERVICE
C- CASTES U- UNTOUCHABLE- CHAMAR etc.

Fig. 7.1

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SOCIO-SPATIAL STRUCTURE

The morphological structure of the sample villages in the study area is mainly determined by their socio-economic as well as physical attributes. Landownership and caste system have played a crucial role in determining their spatial morphological structural. Field studies of sample villages have shown that although Brahmans, occupy the highest rank in social hierarchy, but do not hold the central or best available sites of the villages, whereas people of second and third order of the social hierarchy Jats and Gujars, occupy the central or best available sites, and have largest land holdings in these villages. The lowest strata of the society, namely people belonging to the scheduled caste generally live in congested residence on the periphery of villages, away from the higher caste dwellings. At times, caste based hamlets also emerged within the village territory, having caste names. Such hamlets through physically isolated from each other by intervening fields, water bodies, grave land, street etc. are functioning well-knit together as components of a single unit under the old Jajmani system. Thus social space and functions are expressed through various morphological pattern, which can be studies on the basis of the following models.

Religio-Ritual Model

The villages have various hierarchy and ranking of Jatis still practicing age-old customers and maintaining religio-ritual
distance in behavior. The Hindu social organization is based on caste system. Caste is a very important feature in India's life and culture. No other social institution has played such a vital role as that of caste in the development of village society. The Indian society is split up into many self contained divisions of caste on which each caste has its own way of life, with its distinct profession, ideology and behaviour. People of one caste and clan are closely knit together by common tradition and belief. They are found very close to each other and work in harmony. Different patterns of religio-rituals distances among various caste and Jatis (sub-castes) have been found in the village of different locations of the study area. The segregationist notions of castes such as purity, pollution and untouchability etc. maximizes social distance between the higher and lower castes. The stigma of pollution can notes a sense of ritual distance between different castes and determines the spatial arrangement of their respective dwellings in the villages. There exists a Bahmins-untouchable ritual continuum in which all other various castes occupy different niches; these placements however, in the middle rungs of ritually determines social scale, vary in different regional and structural models.¹ Such caste segregation, being maximum during the early days of settlements, led to the establishment of caste based hamlets in the village. In case of compact villages, the untouchables were confined

¹ Mandalbaum, D.G. “Society in India”. University of California Press, Berkley, Chapter 12.
to the periphery of the settlements in south, southern and sometimes in the north to maintain the supposed purity of air and village environment. But, this model does not explain other pattern visible in many parts, hence a secular model was adopted.

**Secular Dominance Model**

It is the territorial hold by the dominant family or kin group or the Jati or the caste in the village through the control of the village land resources, which fulfills the most basic needs of the majority of the villagers by providing the source of food or livelihood, shelter or house or home within the village, protection and security of a job, and a position or status in the village society and freedom of movement.¹ The land-owing dominant caste group articulated the setting and socio-economic pattern of the village society. The functional interdependence generates an atmosphere of co-operation in the countryside in which caste barriers tend to be disregarded in spite of the stigma of untouchability attached to lower castes. This brings down the distance between these two social groups, making rural settlements compact and unified. But the village pattern of the past in much affected now and explanation of the additional expansions or relocation needs a separate model.

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¹ The Concept of 'dominant caste' was first introduced by M.N. Srinivas in "The Social system of a Mysore Village" in Marriot M (ed.) 1955: Village Indian studies in the little Community, Chicago University Press, pp. 1-35.
Economic Space Model

After independence villages experienced change in the occupancy and expansion of various sites irrespective of the factors explained through the two models. The coming of separate tolas, Purwa or Pattis (hamlets) may best be explained by economic factors, hence, economic space model. In some cases it has been seen that gowala spread towards the jungle area to avail maximum benefits of stock raising and cultivation of their own field, Chamars (Jatav) came along the road to enjoy the free front of the road avoiding congestion of the main settlement and other are occupying temporary bases (pump-set location). Road has attracted various caste people for economic gains. This roadside expansion is new phenomenon in rural countryside resulting from development of transportation means, hence, job opportunity.

The following three villages have been selected randomly to present the actual picture of various aspect of rural settlements and their social morphology. These are Aghapur, Sinsini and Adhawali.

1. VILLAGE AGHAPUR

The village is situated at a distance of 10 km from Bharatpur and 58 km from the historic city of Agra at 57°02' North latitude and 77°04' East longitude, height from mean sea level 282 meter. The approach to the village is easy and convenient. On the north
extremely of the town Bharatpur there is a gate which was constructed in year 1921 to commemorate the visit to Ghana of His royal Higness and Prince of Wales. The mettled road through the gate goes right up to the town of Dholpur, but at the 6th km stone on the road a kutcha diversion of about half km by the side of pond, leads to the village of Aghapur.

**Historical Set-up**

The village, Aghapur, is supposed to have derived its name from a mythological character named Agh or Aghasur who was the commander of Kansa, the ruler of Mathura and maternal uncle of the celebrated lord Krishna, whose account is given in the Srimad Bhagwat in its 12th chapter. It has been stated in Indian Archeology 1961-62 that Painted Greyware Pottery has been discovered from Aghapur. It shows that the Aghapur belong to a period which may be taken as potohistoric (1500 BC). The village is, however, shrouded in darkness regarding its history during the centuries prior to the advent of muslim rule in Delhi. It appears that during the Mughal times Aghapur with the surrounding areas was occupied by the Muslim rulers and in course of time it passed into the hands of later Hindu Jat rulers of Bharatpur. It has been stated in the Misal hakiat and WazIBUT Arz of village Aghapur of Samwat 1986 (1930AD) that the Siradhna Jat settler came to this place. Their ancestor, Mirta Chaudhary, is believed to have eloped with a married woman of his community from Delhi and, to escape
punishment by the community Panchayat, he hid himself in Aghapur.

Physical Set-up

Aghapur is located on the slopes of the hillrocks known as the khera. It is bounded on the north by village of Kanjaron-ka-base on the east by village Darapur, on the west by village Kapoli, and on the south by Ghana forest. The Khera mound on the slopes of which Aghapur is located is about 15 meter high. It consist of a stratification of blackish grey rocks. On the Northern side of Khera, is a deed fissure at the bottom of which 12 meter or 13 meter below the apex is an adobe of a dozen pythons which hibernate in winter and creep to the top of the mound and kill such animals as fall a prey to them. This is a semi-compact village having roughly rectangular pattern. The abadi in the village proper is spread over the slopes of the hill at separate places, each community having its own separate entity. The houses of higher castes are in the centre of the village while those of the lower outskirts. The village is intersected by three lanes and two bye-lanes. The house can be grouped into three types. Ghar (residential quarters), gher (place used as cattle shed and for storing fodder etc.) and ghar-gher (used for all purpose). The ghars are mostly built in the outer margin of main inhabited site in the western part other occupied by residential quarters. The villages have one government primary school and one government middle school. There are two places of worship. In one the ideal goddess Chamunda, which is said to have
excavated from the local hill, is installed on a small platform at one extremely of the village. Another is a small masonry structure in which there are Shiva-linga and the image of goddess Paravati and Shiva's scared bull Nandi. There are 13 masonry wells in the village. They supply water for drinking and washing as well as for irrigation.

There are 201 households in village, out of the total 50% are pakka and rest are mixed and kaccha. The kaccha houses are made of mud-walls and flat roof. On an average 6-7 persons are living in one house. Housing condition in the village is not so good because there is no set plan. Member of chief land owing castes of the village live in spacious pukka houses. People belonging to lower communities like chamars, nai, dhobi etc, live in one or two houses without any provision for ventilation or sanitation.

**Economic Set-up**

Aghapur is purely an agricultural village. The villages have no economic resources except the land which they till and animals which they keep. The primary sector dominates the economic structure of the village. Cultivators and agricultural laboureress constitute the primary sector. The cultivators are further subdivided into three categories, namely, landowners, landowners-cum-tenants and tenants. The number of landowners-cultivators with large holdings and of pure tenants are quite negligible. On the
other hand, there are landowners with small landholdings some of whom do not cultivate their land themselves.

The village covers the 612 hectare land area where only 60% of the land under agriculture and remaining 40% is not suitable for agriculture. The Jats are dominant caste as far as land holding is concerned. They are large landowners. The Gujars are small landowners cum-tenants and the Chamar (Jatav) are agriculturer labourers.

The use of some modern agriculture innovation in terms of power, fertilizers, improved seeds credit facilities, marketing etc. has helped to increase production considerably and has brought the total land of the village under plough and double cropping. Large-scale mechanization is not possible due to the small size of land holdings. Most of the produce obtained from cultivation is utilized by the villagers for their own use. The surplus of wheat and gram is sold in the market at Bharatpur. The cash crops of oilseeds and sugarcane, and the vegetable grown by them are also sold at Bharatpur. The existence of secondary and territory does not mean that secondary and territory activities do not exist in village, except for a few shopkeepers. The secondary and territory sector workers work in nearby urban centre like Bharatpur, Agra and Jaipur cities. The secondary and territory accounts for 15 percent of the total workers which represents a good contribution of employment in different activities.
Social Morphology

The Jats are the dominating caste in the village. They constitute about 19% of the total population of the village but they occupied about 80% of land of the village. They are occupying the best of the possible site like whole of western and central part. The other castes followed by Jats are Gujars and Bahmins. The eastern side covered by Gujars. Brahmins are occupying the site near the temple. The Gujars have 43 households and constitute 214 persons. Brahmins have 35 households are population of 168 persons. The other castes are Banjara, Sikh, Kumher, Nai, Lodha, Kacchi who occupy the scattered position in the village. The house of scheduled caste (Chamars) are found at south eastern part of the village. All the preceding discussed model are quite applicable in their village as the best site are occupied higher castes like Jats, Brahmins and Gujjars. The scheduled castes live in congested residences usually the periphery of the villages, away from the higher caste dwellings. But the village is changing gradually. Community life is being replaced by individualism. The behavioral change in the nature of the society is due to the changing economic forces.

Shows the different community, having number of households and population and (Fig.7.2) shows the social morphological structure of village.
### Table 7.1

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Community</th>
<th>Number of Households</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jats</td>
<td>49</td>
<td>240</td>
</tr>
<tr>
<td>2</td>
<td>Gujars</td>
<td>43</td>
<td>214</td>
</tr>
<tr>
<td>3</td>
<td>Brahmins</td>
<td>35</td>
<td>168</td>
</tr>
<tr>
<td>4</td>
<td>Banjara</td>
<td>20</td>
<td>149</td>
</tr>
<tr>
<td>5</td>
<td>Sikh</td>
<td>18</td>
<td>105</td>
</tr>
<tr>
<td>6</td>
<td>Kumher</td>
<td>12</td>
<td>99</td>
</tr>
<tr>
<td>7</td>
<td>Nai</td>
<td>9</td>
<td>98</td>
</tr>
<tr>
<td>8</td>
<td>Lodha</td>
<td>78</td>
<td>66</td>
</tr>
<tr>
<td>9</td>
<td>Chamars</td>
<td>6</td>
<td>70</td>
</tr>
<tr>
<td>10</td>
<td>Kacchi</td>
<td>3</td>
<td>34</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>201</strong></td>
<td><strong>1243</strong></td>
</tr>
</tbody>
</table>

**Administrative Set-up**

The scheme of democratic decentralization of administration was introduced in Rajasthan on 2nd October 1959 and statutory Panchayat was formed in the village in 1961. The local village government, known as gram panchayat looks after the village administration. The Gram Panchayat consist of 15 elected members with one as the leads of the team, known as Sarpanch, being a mature person with administrative skills, could manage the village affairs quite smoothly. Dirty streets, abandoned street lights, distillation of illicit liquor, conflicting resources, disputes, infighting among the local members mark the order of the day, which indicates inefficiency of the Garm Panchayat in safe
guarding the public interest. This, of course is a serious issue demanding immediate action. The present state government wants to give more judicial power to the Gram Panchayat. The present system of structuring the Panchayat and their functioning should be thoroughly investigated. The Panchayat's need to be constituted so that they can deliver the goods. Otherwise the judicial powers vested with them will be liable to misuse and can add further danger to the village life. If not all the members, at least Sarpanch should be educated and mature person.

**Infrastructure Set-up**

Since the village contributes the lion's share in the state economy, the state government is taking a keen interest in upgrading rural areas. Villages are being provided with required infrastructure as and when funds are available. But the infrastructural facilities lack rationality in their distribution. In some cases, it is just a matter of chance that a particular facility is given to a village, in other cases it is due to political pressure. Rural life has been improved, but the way in which the facilities are bonded to be limited.

There are one primary school, one middle school, 10 government hand pumps, a pond which is used for Pisciculture, street lights, some small shops fulfilling daily needs. In addition services one primary health centre and one government toilet (Shauchalay) are also available.
2. VILLAGE SINSINI

The village situated at a distance of 13 km south of Deeg and 29 km north-west of Bharatpur. It lies at 27°40' North Latitude and 77°20' East longitude. The approach of the village is easy and convenient. The state Highway 14 runs about 5 km east to the village. In the southern portion of the village the boundary of Kumher Tehsil passes. The village is bounded by Siswara village by north, Janoother in west and Badangarh in east.

Historical Set-up

It is an important village of the district because it was founded by forefather of Sinsiwar Jat during the sixteen century. Before the Jats it was dominated by Matsya tribe in ancient days. In the Mughal period it was under the Agra sarkar. The Sinsiwar Jats took the name of the clan from this village Sinsiwar. They were the most powerful rulers of Bharatpur. Regarding the origin of Jats of Sinsiwar clan Tod¹ has observed; "the Jats are branch of great Getric race, of which enough has been said about them. Though reduced from the rank they once had amongst the 'thirty six royal races'. They appears never to have renounced the love of independence, which contested with Cyrus in their original haunts in Sogdina. The name of Cincinnatus of the Jats who abandoned his plough to lead his countrymen against their tyrants, was

Chooraman. Taking advantage of the Sanguinary civil wars among
the successor of Aurengezeb, they created petty castles in village
(whose land they cultivated) of Thoon and Sinsini and obtained the
distinction of Kuzzaks or robbers, a little which they were not slow
to meant, by their inroads as far as royal abode of Ferochesen. The
Syeds then in power, commanded Jay Singh of Amber to attack
them stronghold, and Thoon and Sinsini were simultaneously
invested”.

Physical Set-up

The village Sinsini is a large and compact having roughly
circular shape. The village has an area of 2428 hectares with
population of 7102 persons. There are 967 households were 70%
are pakks house, 20% are kaccha and 10% mixed houses. The
Jats consists of 40% of the population and occupying 70% of land.
The other caste followed by Jats are Brahmins. The Brahmins who
control about 20% land and 17% of total population. The Gujars
and Chamar (Jatav), Mahajans rank third, fourth and fifth
respectively to their numerical strength. It has observed that other
remaining caste have little land holding and little households also.

The house of different communities are located at different
settlement site in different directions which present distinctive
physical proximity. These settlement sites are known after the
predominance of the caste, as such these location show a
distinctive sense of territorial as well as spatial identity themselves.
The Jats occupy the central position and concentrated in western and southern side of the village. These are six temples in the village. The Brahmmins are concentrated around the temples. The Gujars and Mahajans occupy the northern position of the village. The upper caste Jats, Brahmmins etc mostly have pakka house and lower caste are scattered in periphery of the village and they mostly have kaccha houses. Some have mixed houses. This large village have one primary school, one school, one high school, one intermediate college and one adult literary centre. This shows that the village is educationally developed.

The village has good interlinked with other villages and towns. The Bus stop is situated in the middle of the village. There are many lanes and by-lanes intersect the village. All the roads are paved with bricks. There is also proper drainage system, but in rainy season the drain over-flow leaving the condition worsen. There are many wells, tanks tube well, hand pumps for drinking as well as for irrigation, but water facilities is not up to the mark. The management and development of water resources is perhaps the most important physical infrastructure in the rural setting, without water not a blade of grass would grow and modernization of agriculture and allied sector solely depend upon adequate and controlled irrigation.

**Economic Set-up**

The village's entire's economy revolves round the agriculture. It is the largest single contributor of all the communities except few
who are engaged in secondary activities or territory activities
within the village or outside doing the job or business activity.
Though the turn out from agriculture is highest as compared to
other economic resources, it is insufficient to meet the normal
need of certain communities because of their meagre land holding
or the machinations of the village money lender or other parasites.

The village has area of 2428 hectare where 135.99 hectare
are not available for cultivation and 5.55 hectare are cultivable
waste land. The rest of land is used for cultivation. But there is
lack of irrigation facilities, the total cultivation is depend upon
monsoonic rain.

Transferring of direct occupancy rights to the tillers of land
has been a very revolutionary reform through recently carried out
by the state. It has made some change in the pattern of
relationship existing before. There are improvement in method in
cultivation, mechanization of agriculture process etc.

**Social Morphology**

The Jats are the dominant caste consisting abut 40% of the
total population of the village. They have occupied the southern
and western portion of the village. They have 403 households and
population of 2848 persons. The other dominant caste followed by
Jats and Brahmin who occupy the 17 percent of population and
20% of land holdings. They have 170 households which
Fig. 7.3
accommodate the 1207 persons. They occupy the central position and around the temples. There are 150 households of Gujars having population of 1065 persons occupy the northern portion. The Chamars ranks fourth and have 106 households and population of 852 persons. The Mahajans have 68 households and population of 426 persons. The Meos who are Muslims occupy the north-west portion of the village, there are 31 households of Meos which accommodate 243 persons. The other castes Kolis Nai, Sonar, Badhai are little in their numerical strength. The Brahmins occupy the highest ranks in social hierarchy, but the Jats holds the best available site and largest land holding of the village. The scheduled castes have the peripheral position of the village. After independence it seen that the stigma of caste influence has lost its importance over economic gains and it become the potent one. The table shows the number of households with population Fig. 7.3 shows the social morphological structure.

**Administrative Set-up**

The Gram Panchayat consists of 15 elected members to look after the village administration. The village Pradhan from Jat community is running the village administration very smoothly with the help of other elected members. Under the new Panchayati Raj acts, many new schemes of development has been introduced in the village to allocate poverty, selection of beneficiaries,
imposition and advancement of taxes act. The most important programme given to the Gram Panchayat is resource planning. The Gram Panchayat prepares an inventory of human, physical and other available resources for the development of village. Some

Table 7.2

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Community</th>
<th>Number of Households</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jats</td>
<td>403</td>
<td>2748</td>
</tr>
<tr>
<td>2</td>
<td>Brahmin</td>
<td>170</td>
<td>1207</td>
</tr>
<tr>
<td>3</td>
<td>Gujars</td>
<td>150</td>
<td>1065</td>
</tr>
<tr>
<td>4</td>
<td>Chamars</td>
<td>106</td>
<td>852</td>
</tr>
<tr>
<td>5</td>
<td>Mahajans</td>
<td>68</td>
<td>426</td>
</tr>
<tr>
<td>6</td>
<td>Meos</td>
<td>31</td>
<td>243</td>
</tr>
<tr>
<td>7</td>
<td>Kolis</td>
<td>17</td>
<td>192</td>
</tr>
<tr>
<td>8</td>
<td>Nai</td>
<td>12</td>
<td>145</td>
</tr>
<tr>
<td>9</td>
<td>Sonar</td>
<td>7</td>
<td>89</td>
</tr>
<tr>
<td>10</td>
<td>Badhai</td>
<td>3</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>967</td>
<td>7102</td>
</tr>
</tbody>
</table>

agitating problems of villagers are garbage disposal, adequate toilets, unemployment, law and order, electricity fluctuation etc. All the inadequacies adversely affect the living and functions of farmers in the village.

Infrastructure Set-up

The infrastructural facility reflects the development of the village. Being a large village the infrastructural set-up is also good. The village has a six temples have a Shiva Krishna idol with his flute in installed by the side of his consort Radha. There are one
primary school, one middle school, one high school, one Intermediate college and Adult literary centre. The medical facility is also available in the village. There is one hospital, two dispensary, one Health centre, one primary health sub-centre, one primary health centre. There is a post office and telephone exchange which enhance the communication.

There are about 15 shops in the village which sells every day's goods. The weekly market hat is held on every Sunday and animal hat is also held.

3. VILLAGE ADHAWALI

Adhawali is a small village in Deeg Tehsil of Bharatpur District. It is situated 15 km west of Deeg at 27°30' North latitude and 77°10' East longitude. The approach to village is easy and convenient from Deeg which is the nearest big town. It is bounded by Jaten village in north, Nagoi village in east and Bedham village in south. The other road to Adhawali from TehsilNagar which is situated western side of village. Villagers use to go by tangas, Jeep, buses to these Tehsil headquarters.

Historical Set-up

According to the resident of Adhawali, the village is so called because the goddess, Harshat Mata, in the local temple has been shown in a Joyful mood and spread brightness or abha all round. It was abha wali before, but illiterates began calling it adhawali.
The other source reveals that this village is founded by Chaudhary Jat clans. The forefather of this clan Chaudhary Ratan who migrated from Mathura to this place who allotted many zamindari by Rani Kishori who belongs to this clan. The Jats are the dominants caste in this village.

**Physical Set-up**

The village is small and semi compact roughly rectangular pattern. The area of this village is 440 hectare of which only 30 hectare is barren. Almost the entire lot is put to profitable use of the residents. The soil is sandy loamy and is suitable for growing kharif and rabi crops. Some 30 km to the north of the village some rise hills found in Pahari sub-division but they are very low and do not obstruct the passage of rain bearing clouds. Being comparatively remote they do not influence the economy of the village in any way.

Village unlike towns and cities, seldom experience any major change in their aerial extent. The main reason for this slack physical expansion is the out migration resulting from saturation of the agriculture sector, absence of any other employment opportunities in villages, and increased literacy in rural areas.

There are only 151 occupied residential house in the village. Out of the total 60 percent are pakka and 20% are kaccha and rest 20% are mixed houses. This does not mean that the proportion is
true some 20 years back, actually the reconstruction of kaccha house into pakka house has gone on at a pace. Pakka houses mostly belong to Jats, Brahmins and Gujars. The kuccha houses belong to lower caste like, Chamars, Nai, Bhangis etc. The chief land owing caste is Jat and occupying the best suitable site of the village. There are one primary school one primary health centre in located in the village. There are 10 wells, two tanks and 3 tube-wells and 15 hand pumps located in different position at the village.

**Economic set-up**

The main economic resources of the communities residing in the village is agriculture. Livestock is the next important resource of economy. There is no special establishment engaged in animal husbandry, but most of the families keep cattle which contribute to economy of households.

With the introduction of land reforms and the enforcement of Jagirs and Maufies Resumption Act, the Muafis was resumed after payment of compensation and the maufidar was conferred Khatedari rights on the land which was found in his possession and was self cultivated. On the promulgation of the Rajasthan Tenancy Act and the Land Revenue Act, the cultivators who has been tilling land themselves were granted khatedari rights. Due to increase in population there is heavy pressure on land, but current fallow land and uncultivable land can not brought under plough as
the soil has been washed away from the rain water. If the people is not adopting the soil conservation methods, the entire land of the village would have been ruined. Further, no industry has been Set-up in the village and no improvement has been made in the means of communication. There has been no expansion of irrigational facilities from 1st October, 1952 the state has provided credit facilities for establishing co-operative society in the village but the villagers have not utilized there facilities and still depend on money-lenders in the village.

Social Morphology

The Jats are the dominating caste in the village. They constitute 47% of the total population. They occupy the best possible site whole northern and central parts of the village. They occupy about 93 percent land of the village. The Brahmins comes second in terms of population, they occupy 11 percent population of the village. They occupy the central position and they perform the religious work of the village. They are the most respectable caste of the village. The Gujars, Mahajans Meos, Kolis have little households as well as population. They are settled in southern part of the village. The houses of scheduled caste Bhangis are found in the southern corner of the village built up area while Chamars are found in the southeastern part adjacent to Bhangis. Al the above-discussed models are quite applicable in the village morphology.
Table 7.3

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Community</th>
<th>Number of Households</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jats</td>
<td>64</td>
<td>436</td>
</tr>
<tr>
<td>2</td>
<td>Brahmin</td>
<td>17</td>
<td>102</td>
</tr>
<tr>
<td>3</td>
<td>Gujars</td>
<td>15</td>
<td>90</td>
</tr>
<tr>
<td>4</td>
<td>Mahajans</td>
<td>12</td>
<td>73</td>
</tr>
<tr>
<td>5</td>
<td>Meos</td>
<td>9</td>
<td>46</td>
</tr>
<tr>
<td>6</td>
<td>Kolis</td>
<td>9</td>
<td>42</td>
</tr>
<tr>
<td>7</td>
<td>Kumher</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>Nai</td>
<td>6</td>
<td>32</td>
</tr>
<tr>
<td>9</td>
<td>Chamars</td>
<td>6</td>
<td>33</td>
</tr>
<tr>
<td>10</td>
<td>Badhai</td>
<td>5</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>151</td>
<td>929</td>
</tr>
</tbody>
</table>

As the best site are occupied by higher caste like Jats, Brahmins and Gujars. The scheduled castes live in congested residence usually on the periphery of the village, away from the higher caste dwelling. Table 7.3 shows the number of households with population of different community. Fig. 7.4 shows the social morphological structure.

**Administrative Set-up**

With the introduction of the scheme of democratic decentralization in Rajasthan in 1959 every village in the state has covered by a Gram Panchayat. Due to very small number of resident in certain villages of Rajasthan, several villages have been put together to form a Panchayt. The village Adhawali is comprised of five villages. The total number of Panchas are 10 including the
co-opted lady member, one of whom is from the scheduled caste. The village Panchayat came into being in 1961 in which three Panchayat from Jat community, one from Brahmin, one from Gujar, and one from the Mahajan, one women from scheduled caste and another from the Brahmin community were elected unanimously as member to it. The Sarpanch is elected from member of the village Panchayat. He belongs to Jat community. He is also member of Panchayat Samiti. The Sarpanch is assisted by a Secretary, who gets a monthly allowance for doing writing work. The meeting of Panchayat is held twice in a month and its function is to examine the need of the people, prepare village plans, and submit them to the Panchayat Samiti for being included in tehsils plans. The plans are sanctioned by the government according to priorities and availability of funds. The village development plans are executed through the village Panchayat which is fully responsible for the execution of programme. It is the duty of village Panchayat to raise funds by voluntary contribution from local people for community works.

**Infrastructural Set-up**

The village being a small do not have much infrastructural set-up. There are only one temple located in the centre of the village. There are one primary school and one Primary Health Centre. For the further studies students have to move to other
nearby villages where higher education facility is available. In the primary health centre only selected medicine is available and there are only one doctor, one nurse and one ward boy, who run the health centre. There are 10 wells, two tanks, 3 tube wells, and 15 hand pumps which fulfill the need of drinking water as well a irrigation. The electricity is also available for domestic purpose but only rich people of the village avail this facility.

The foregoing analysis of the socio-spatial morphological structure of three villages of the study area i.e. Aghapur, Sinsini and Adhawali shows the existence of the habitations of the most of the people belonging to service caste near to those of higher caste, thus forming a closely knit social structure. This is due to the economic decency of the former on the latter groups of caste under the Jajmani system. The analysis of the spatial pattern of different caste reveals that segregation is closely associated with the caste of the inhabitant, resulting in the formation of distinct settlement units. Thus the pattern of religio-ritual cum-functional interaction is the factor that is responsible for spatial distribution of different caste, which is exhibited, in the socio-spatial organization of the sample villages.
CONCLUSIONS AND SUGGESTIONS

After foregoing discussion regarding the evolution and spatial organization of clan settlement in Bharatpur District, it may be concluded that the district is primary agricultural in composition. Its rural society is tradition bound and the caste system still plays a dominant role in it, though, winds of change have started blowing across it, which have begun to affect the rigidities of the hierarchy of castes.

The different historical records, settlement reports, district gazetteer and field study make it clear that the settlement of this region has begun around 1500 B.C. and in the past the region was inhabited by Matsya tribe before arrivals of Aryans. By the end of the seventh century B.C. the Aryanization of the area has been completed. The region was first affected by the migration wave of Jats clan at the beginning of the twelfth century A.D. and migration of the various corporate groups or clans a much larger scale followed by Muslims invasions in 1195 A.D. a wave of migration continued upto 18th century, each of which has left its imprint upon the study area.

The most visible feature in the cultural landscape is the settlement, and it has been observed the distribution of rural settlement is influenced by various factors. Out of the several physical, social, economic and political factors, a few factors are
more responsible for the distribution of rural settlements. However, the settlement distribution is not only determined by the natural condition but also influenced by socio-economic factors.

Four clans, namely, the Sinsiwar Jats, Sogarwal Jats, Chaudhary Jats, Meos, have been analyzed with the help of available literature, field survey and historical records. It has been observed that these clan settlements were diffused over the region by taking time nearly 300-500 years with the three stages of spatial diffusion processes. To measure the diffusion stages, seven dimensional attributes are considered: time (T), distance from parents settlement (L), population (P), number of settlements (n), length of time (S), population energy (p), and lastly viscosity of landscape (V). During the first stage of settlements diffusion process, the founding settlements are recorded in few places due to limited availability of the land and presence of vast jungle, except in the case of Sogarwal Jat clan settlements. In this case vast land was available and so they had established larger number of new settlements.

The second stage of spatial diffusion process mark with the establishment of a number of new settlements. It is due to population concentration and foundation of new hamlets.

The third stage was marked with stratification and competition (the tendency to produce great regularity in the
settlement pattern). It has also been recorded that during third stage of spatial diffusion process the number of founding settlements is much less. Since 1800 A.D., nearly all available land was occupied by the clans and they did not establish additional settlements on their fertile land. It has also observed that Sinsiwar Jats have found additional settlements during the third stage of diffusion process due to natural growth of population. A reverse relationship between the distance and population of daughter from parent settlements is recorded: as the distance of daughter settlements from parent settlements increases the population of daughter settlements from the parent settlements decreases and vice-versa. It has been recorded in Sogarwal Jat clan settlements but in other cases such as the Chaudhary Jat clan and Meos clans different relationship has been found. A positive relationship is recorded in the population energy (p) and viscosity of landscape (V): as population energy (p) increases the viscosity of landscape (V) also increases. It is due to immigration and presence of market centers.

Caste ranking is determined in the light of population and economic power (landownership). Three village have been taken into consideration. It has been noted that the Jats stands first rank (landownership and population dominancy) followed by Brahmins, Gujurs and others.
The quantitative analysis of spacing of rural settlement at panchayat Samiti level has revealed that there is a direct relationship between spacing and the size of the settlements. It is obvious that where spacing is high, villages are larger sizes, with a small number of hamlets having higher densities of population, which results in compact structure of settlements. On the contrary in areas of low spacing, settlement are generally smaller in size with low pressure of population and scattered distributional patterns, viz., hamlet type of settlements. The nearest neighbour distance approximation analysis of rural settlement has revealed that settlements are more regular than random.

An analysis of shapes of the villages show that the average shape index of the study area being 0.638. About 17 per cent of the villages conform roughly to rectangular or square shape. No village has a very elongated shape while nine villages approach near circular shape.

Contact index, population density and areal size do not show any significant co-relation with existing almost homogeneous environmental condition in the region.

Transformation of village shape into Dirichlet/Thiesson polygons and hexagons ought to be taken into consideration, while making plans for rural development. It has been found that village sites are mostly determined by physico-cultural factors where as markedly centres have developed at the intersection of roads or
along the roads. As the number of markets centres increase the services area of individual market centres decreases. Increasing Christaller's K values may be taken as an index to represent better efficiency of purchasing power and development on the one hand and transport connectivity of a region on the other, which should be taken into account while making plans.

The morphology of rural dwellings in the study area shows that the building materials and the architectural style are the expression of the physical factors of the region, whereas the ground plans are closely related to the socio-economic conditions of the residents. Mud or clay, is widely used in the district, because plenty of cheap clay is on hand to construct walls and roofs. The size of the dwelling reflects the economic conditions of the dwellers.

The social morphological study of three selected villages (built up areas) reveals that the economic power of the people and caste plays a decisive role in the selection of best available site for settlement. The analysis of the spatial patterning of rural dwelling of different caste shows that segregation is closely associated with caste inhabited in the villages.

To improve the living conditions of the rural peoples and their settlements, it is important to comprehend the socio-economic condition of the people and the potential resources of villages. The rural settlements are tradition bound and its nature
of built up area is spontaneous. They are closely knit together through invisible thread of social fabric, and interdependent to one another to carry out their socio-economic business. Breaking of joint family system, pattern of existing dwellings, fragmentation of land holdings, social conflict are some of the cause for haphazard growth and mushrooming of settlements in countryside. In view of the above facts some of the important suggestions based on field experiences have been made to obtain the sustainable development of the countryside. These are as follows:

1. In order to improve housing conditions, house should be simple in design. Bricks that can be locally manufactured at the same time generating local employment can replace mud walls.

2. The congestion of houses may be relieved by providing extension site for them. This can also be achieved by filling up the stagnant ponds and pits lying near the settlement sites. These pits and ponds served useful purpose in medieval and ancient days but now they are turned into breeding grounds of mosquitoes.

3. All the villages and hamlets should be connected with brick line road with a view to maintain cooperation among the different sections of the society and improvement of their socio-economic conditions.
4. The sewage system needs improvement by providing soak pits for individual houses and pucca drainage for the streets, but both should be cleaned periodically.

5. Cattles pens and sheds should be kept little away from the dwelling sites attached to it with a view to good sanitation.

6. There should be provision to dry latrines near the inhabited sites to avoid the unhygienic practice of defecating in the open field.

7. Extension of safe drinking water through more tube-well installations.

8. Electric connections should be extended to every bit of the region.

9. Provision of better education, health facility for all and popularization of family planning measures, so that dependency burden on worker can be lessened.

10. Schemes for developing pisci-culture, dairying and poultry farming have been suggested.

11. The illegal gathering of forest produce should be regulated by introducing social-forestry, small scale industries or handicrafts generating rural employment and income.

12. Lastly, planning will be facilitated if further research in oriented to find out the process of human adjustment to environment.
National and International development policies are giving higher priority to distribute the benefits of development to the poor and other disadvantaged, through a combination of accelerating overall growth and disintegrating more of the benefits directly to those groups. For the development of human settlements the available resources should be used efficiently and to its optimum level to provide jobs, goods and services to the needy people of the rural areas; since poorest of the poor lives there. National and International development efforts seek to increase agricultural output and rural employment and incomes, the spatial focus of settlements policy must expand to include rural settlements as well as urban settlements. One way or another, the inhabitants of rural settlements should be provided with at least minimal facilities for safe drinking water, primary health care, education, marketing and storage facilities for agricultural produce and inputs and opportunities to earn enough income whether in cash or kind, to provide adequate food, clothing and shelter. In addition, national settlements policies and plans should strive to provide the rural population with access to a wider variety of occupations and cultural facilities so that ambitions, educated rural people will be able to find challenges and rewards commensurate to their abilities.
**GLOSSARY**

<table>
<thead>
<tr>
<th>Local Names</th>
<th>English Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abadi</td>
<td>Inhabited part of the village site</td>
</tr>
<tr>
<td>Angan</td>
<td>Open Court-yard at yard house</td>
</tr>
<tr>
<td>Babool</td>
<td>A moderate size of Accacia arabiea evergreen tree.</td>
</tr>
<tr>
<td>Baithak</td>
<td>Resting place</td>
</tr>
<tr>
<td>Ban</td>
<td>Twin made of moonj</td>
</tr>
<tr>
<td>Banjar</td>
<td>The Cultivable waste land</td>
</tr>
<tr>
<td>Basti</td>
<td>Settlement site</td>
</tr>
<tr>
<td>Bhangar</td>
<td>Old alluvium</td>
</tr>
<tr>
<td>Bhur</td>
<td>Light soil</td>
</tr>
<tr>
<td>Bigha</td>
<td>A local land measure equivalent to 0.625 acre</td>
</tr>
<tr>
<td>Biri</td>
<td>Indigenous cigarette made of leaves of tendu tree and tobacco</td>
</tr>
<tr>
<td>Bitorah</td>
<td>The cowdung collected, dried and heaped into a miniature hut</td>
</tr>
<tr>
<td>Black-And-Redware</td>
<td>According to B.B. Lal,&quot;Pottery whose interior and the top part of the exterior is red. The colour effect is produced by putting the pot upside-down in the Kiln. In India such pottery appeared early as 2000 B.C and continued, of course, with modifications, up to the beginning of the Christian era.</td>
</tr>
<tr>
<td>Brahma</td>
<td>The Hindu God Supreme</td>
</tr>
<tr>
<td>Brahmins</td>
<td>Highest, Hindu Caste, India</td>
</tr>
<tr>
<td>Burji</td>
<td>Stored husk in a miniature hut.</td>
</tr>
<tr>
<td>Chabutra</td>
<td>A raised platform in front of the main entrance, India</td>
</tr>
<tr>
<td>Chak</td>
<td>Block of land</td>
</tr>
<tr>
<td>Chamar</td>
<td>A low caste community, India</td>
</tr>
</tbody>
</table>
Chamartoli  Hamlets of Chamars
Chappar  Thatched roof
Chauhan  A ruling dynasty and a Rajput clan.
Clan  Exogamous group claiming descent from a common group
Dastur  District (during Mughals)
Deorhi  In the context of Newsletters, it means the camp of ruler or chief of the move.
Dih  High land due to deserted settlement site.
Doab  Land between the rivers
Dubari  Entrance room of the house
Goan  A village settlement
Garhi  A mud fortress, a castle
Ghat  Platforms or step at edge of lake or river water
Gher  Female House
Gur  Jaggery
Hat  Market place
Haveli  A large masonry house.
Jagir  Land or villages given by state as a reward for services. It was made for a life time and it was not inheritable. The holder of such grant is known as Jagirdars.
Jajmani  A system involving reciprocal relation, India.
Jhil  Small lake
Jori  A field system
Jungle  Forest
Kaccha  Unmetalled
Kankar  Calcareous nodules
Khadar  Low-lying land along river, new alluvium.
Khadi  Hand spun and hand woven cloth.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khandsari</td>
<td>Indigenous white sugar.</td>
</tr>
<tr>
<td>Khanqah</td>
<td>Muslim religious establishment</td>
</tr>
<tr>
<td>Kharif</td>
<td>Season of Summer crops (mid June to October)</td>
</tr>
<tr>
<td>Khasgaon</td>
<td>Main village settlement.</td>
</tr>
<tr>
<td>Loo</td>
<td>Hot wind</td>
</tr>
<tr>
<td>Mahajan</td>
<td>Money lender</td>
</tr>
<tr>
<td>Mahal</td>
<td>A fiscal unit, a subdivided of sarkar</td>
</tr>
<tr>
<td>Mahal</td>
<td>Places, hall</td>
</tr>
<tr>
<td>Mandi</td>
<td>Big market or Bazar</td>
</tr>
<tr>
<td>Maqbara</td>
<td>Tomb or Mausoleum.</td>
</tr>
<tr>
<td>Maufi</td>
<td>Rent free land</td>
</tr>
<tr>
<td>Mauza</td>
<td>A revenue village</td>
</tr>
<tr>
<td>Moonj</td>
<td>Kind of long reed of which ropes are made.</td>
</tr>
<tr>
<td>Muhalla</td>
<td>Residential locality</td>
</tr>
<tr>
<td>Mukhia</td>
<td>Village headman</td>
</tr>
<tr>
<td>Nachirag or Bechiragi</td>
<td>Without habitation</td>
</tr>
<tr>
<td>Nadi</td>
<td>River</td>
</tr>
<tr>
<td>Nala</td>
<td>A Seasonal stream</td>
</tr>
<tr>
<td>Neem</td>
<td>A tropical tree</td>
</tr>
<tr>
<td>Niwar</td>
<td>Thick, wide, cotton take</td>
</tr>
</tbody>
</table>

**Northern Black-Polish-were**

According to B.B. Lal "A distinctive pottery with a highly lustrous surface, usually black but some time steel-grey, silvery or golden. It is wheel made, normally thin-sectioned and well fired, giving a metallic ring. Main concentration in northern India. Date 600-200 B.C."

**Ochre-Coloured pottery**

According to B.B. Lal "Orange to deep-red pottery, found so far mostly in warm-out condition to the extent that the surface rub off by
mere handling, leaving an ochrous colour on the fingers, hence the name. Extent upper Ganga valley-prior to 1200 B.C."

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Pargana</td>
<td>Administration division of tehsil</td>
<td>Patti</td>
<td>Tract of proprietary land</td>
</tr>
<tr>
<td>Phus</td>
<td>Dried coarse grasses used in making thatched roof.</td>
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</tr>
<tr>
<td>Pucca</td>
<td>Metalled</td>
<td>Puras</td>
<td>Hamlet</td>
</tr>
<tr>
<td>Purdas</td>
<td>Veil</td>
<td>Purwas</td>
<td>Hamlets, also puras</td>
</tr>
<tr>
<td>Rabi</td>
<td>Season of winter crops</td>
<td>Rajput</td>
<td>Highest caste after Btrahmins</td>
</tr>
<tr>
<td>Reh</td>
<td>Salt efflorescence</td>
<td>Sarkar</td>
<td>A fiscal unit, sub-division a suba (province)</td>
</tr>
<tr>
<td>Shashtras</td>
<td>Religious literature of Hindus</td>
<td>Shikar</td>
<td>Hunting expeditions</td>
</tr>
<tr>
<td>Shudras</td>
<td>Lowest caste people in India</td>
<td>Suba</td>
<td>Administrative unit during Mughal period.</td>
</tr>
<tr>
<td>Suba</td>
<td>Administrative unit during Mughal period.</td>
<td>Sutli</td>
<td>Twin made of hemp</td>
</tr>
<tr>
<td>Tappa</td>
<td>A unit of land-revenue administration, smaller than a pargana.</td>
<td>Tehsil</td>
<td>Administrative division of a district.</td>
</tr>
<tr>
<td>Tola</td>
<td>Hamlets</td>
<td>Usar</td>
<td>Land full of sodium salt which renders if unfit for cultivation (saline alkali of Alkali soils).</td>
</tr>
<tr>
<td>Zamindari</td>
<td>A land tenure system.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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